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MINDFULNESS AS A PROTECTIVE FACTOR AGAINST BODY DISSATISFACTION:  
MECHANISM OF ACTION

by

Jessica Barrington

A Thesis  
Submitted to the Faculty of Graduate Studies  
through the Department of Psychology  
in Partial Fulfilment of the Requirements  
for the Degree of Master of Arts at the  
University of Windsor

Windsor, Ontario, Canada

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MECHANISM OF ACTION

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## AUTHOR'S DECLARATION OF ORIGINALITY

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## ABSTRACT

Mindfulness is the tendency to pay attention, on purpose and in an open and non-judgmental way, to experiences. An association between higher dispositional mindfulness and body satisfaction has been demonstrated, but the mechanism of this association remains unclear. In the present study, thought suppression was tested as a mediator of the association between mindfulness and body satisfaction, and mindfulness was tested as a protective factor against lowered body satisfaction. In Study 1, participants (N = 234) completed online measures of mindfulness, thought suppression, and body satisfaction. After controlling for depression, self-esteem, and BMI, *describing*, *acting with awareness*, and *non-judgement* were related to higher body satisfaction. When controlling only for BMI, lower thought suppression mediated the relations between higher *describing*, *acting with awareness*, and *non-reactivity* and higher body satisfaction. *Observing* was neither directly nor indirectly related to body satisfaction. In Study 2, participants (N = 69) wrote about a disliked body part or disliked weather, and then completed either a mindfulness or relaxation induction. They then completed measures of state mindfulness and body satisfaction. The mindfulness induction did not result in higher body satisfaction compared to the relaxation induction. Our results suggest that thought suppression mediates the association between body satisfaction and facets of mindfulness involving a metacognitive component. However, self-administered mindfulness inductions do not appear to result in higher state body satisfaction than relaxation inductions. Furthermore, it does not appear that a writing task is sufficient to reduce body satisfaction. Limitations and future directions are discussed.

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## Mindfulness as a Protective Factor Against Body Dissatisfaction: Mechanism of Action

### 1. INTRODUCTION

Low body satisfaction is a prevalent current social concern; up to 90% of college women are not satisfied with their body (Neighbors & Sobal, 2007). Several negative psychological factors are related to low body satisfaction such as depression, anxiety, social phobia, and low self-esteem (Rodgers, Salès, & Chabrol, 2010). Low body satisfaction also is associated with negative behaviours such as dietary restriction, bingeing, and purging (Ward & Hay, 2015).

There are several, common, everyday influences that can reduce body satisfaction. For example, viewing thin peers, compared to over-sized peers, has been found to result in lower body satisfaction (Lin & Kulik, 2002). Additionally, Jansen and colleagues (2016) found that focussing on a disliked body part for fifteen minutes decreased state body satisfaction and increased feelings of unattractiveness. These participants also reported increases in state depression, anxiety, and stress, indicating that even brief changes in appearance satisfaction may influence psychological well-being. Given the high rate of body dissatisfaction, the negative outcomes associated with it, and how easily it can be triggered, there is a need for interventions that effectively protect body satisfaction.

Several interventions have been shown to effectively increase body satisfaction. A meta-analysis by Jarry and Ip (2005) found that cognitive-behavioural therapy significantly improved body satisfaction and that therapist-assisted interventions were the most effective. Another meta-analysis by Alleva, Sheeran, Webb, Martijn, and Miles (2015) revealed that certain types of cognitive-behavioural therapies, such as changing negative language used to discuss the body and teaching individuals to monitor and restructure their appearance-related cognitions, were effective at increasing body satisfaction. Other types of interventions, such as teaching stress-

reduction techniques, guided imagery, and exposure exercises, also increase body satisfaction (Alleva et al., 2015). Alleva and colleagues (2015) further found that interventions were most effective when they were administered in a group format, and when there was a facilitator present, leading the intervention. After controlling for publication bias and small-sample bias, the effects of the interventions were found to be small, but reliable.

Mindfulness interventions may be another way of improving body image. Mindfulness interventions may be preferable to CBT because they act more globally to decrease psychosocial impairment and negative affect, along with improving body satisfaction (Atkinson & Wade, 2014). Mindfulness practice promotes a detached awareness of thoughts and emotions, thereby preventing them from becoming overwhelming (Kabat-Zinn, 2003). Given the negative thoughts that characterize low body satisfaction, mindfulness-based interventions may successfully improve body image. Mindfulness interventions are easy to implement and have no known negative consequences. Furthermore, mindfulness-based therapies can be administered in a group format with a therapist or facilitator leading the practice. As previous meta-analyses show (Jarry & Ip, 2005; Alleva et al., 2015), these are the most effective conditions for body image interventions. Therefore, mindfulness-based therapies have two of the characteristics demonstrated to aid interventions for individuals with low body satisfaction.

### **1.1. Mindfulness**

Mindfulness is a concept that originates from ancient Buddhist philosophy (Le, Ngnoumen, & Langer, 2014). In Eastern philosophies, mindfulness is described as observing one's self and experiences, and being aware of surroundings without reacting to them. Western philosophies tend to regard mindfulness as a disposition, meaning that individuals may possess this characteristic to varying degrees. Recently, these two views of mindfulness have begun to

merge. For example, researchers such as John Kabat-Zinn state that all individuals naturally have some degree of mindfulness, that is their “dispositional” mindfulness, but it can be enhanced through meditative practices such as breathing exercises and Hatha yoga (Le et al., 2014). Kabat-Zinn also described mindfulness as the “awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p.145).

In the psychology literature, researchers generally tend to agree with Kabat-Zinn’s description of mindfulness (e.g. Bishop et al., 2004; Le et al., 2014), but the exact components thought to constitute mindfulness have evolved as research progresses. In research, the various measures used to assess mindfulness seem to arise from different conceptualizations of the components of mindfulness; that is, different operational definitions arise from different theories about the elements of mindfulness. For example, Bishop and colleagues (2004) conceptualize mindfulness as having two different dimensions: *attention* towards present-moment experiences and an open, curious, and accepting *awareness* of what arises in the present moment. These elements of mindfulness are measured by the “Mindful Attention Awareness Scale” (Brown & Ryan, 2003).

Another conceptualization of mindfulness by Baer, Smith, Hopkins, Krietemeyer, and Toney (2006) outlines five facets of mindfulness: *observing*, *describing*, *acting with awareness*, *non-judging*, and *non-reactivity*. *Observing* refers to noticing thoughts, feelings, sensations and perceptions. *Describing* refers to labeling internal experiences, such as thoughts and feelings, with words. *Acting with awareness* refers to attending to present moment experiences and engaging in activities in a deliberate manner, rather than acting automatically. *Non-judging* entails remaining neutral towards inner experiences, such as thoughts and emotions. Finally,

*non-reactivity* consists of allowing thoughts to come and go, without becoming overwhelmed by them, reacting to them, or trying to control, change, or suppress them. These facets of mindfulness are assessed by the “Five Facet Mindfulness Questionnaire” (Baer et al., 2006).

How mindfulness is conceptualized and measured can have important implications for researchers. For example, using the two-dimensional *awareness* and *attention* conceptualization of mindfulness, Brown and Ryan (2003) found that higher mindfulness is associated with lower depression. However, Baer and colleagues (2006) found that while higher levels of the *describing*, *non-reactivity*, *non-judgment*, and *acting with awareness* facets were associated with lower thought suppression, high *observing* was related to high thought suppression. This demonstrates that the facets of mindfulness relate differently to other psychological variables meaning that mindfulness is not a unidimensional construct. Thus, for psychological research, it may be more informative to conceptualize mindfulness as having five distinct components and examine each facet separately when exploring their relations with other psychological variables.

### **1.1.2. How Does Mindfulness Work?**

Individuals have different baseline levels of mindfulness, but these levels can be enhanced through practices such as mindfulness meditation (Malinowski, 2008). Mindfulness meditation involves being aware and observant of one’s surroundings, without trying to attain some higher goal (Valentine & Sweet, 1999). Mindfulness practices vary, but all generally involve focusing on an “anchor,” such as the sensation of breathing. When attention drifts towards other sensations, thoughts, or emotions, the practitioner acknowledges where the mind has wandered and gently brings it back to the anchor. Simply put, the goal of mindfulness practice is to promote an observing and detached state of mind. When thoughts and emotions arise, they are acknowledged but no specific value is ascribed to them (Malinowski, 2008).



The psychological benefits of mindfulness are presumed to come from the non-judgmental, non-reactive, awareness of thoughts and emotions (Malinowski, 2008). It is assumed that by recognizing negative thoughts and emotions, but not judging nor reacting to them, one can prevent the cycle of negative responses to inner experiences that cause emotional distress, such as when a negative thought leads to an emotional reaction, which leads to emotional distress. Thus, cultivating mindfulness through a practice such as mindfulness meditation presumably should lead to better psychological health.

### **1.2. Mindfulness and Body Satisfaction**

Individuals higher in dispositional mindfulness have better psychological health than those low in dispositional mindfulness, as evidenced by lower levels of depression, anxiety, and binge eating (Courbsasson, Nishikawa, & Shapira, 2011; Vøllestad, Nielsen, & Nielsen, 2012). Researchers also have determined that mindfulness serves as a protective factor against developing depression when there are co-occurring risk factors, such as discrimination or previous depressive episodes (Brown-Iannuzzi, Adair, Payne, Richman, & Fredrickson, 2014; Radford et al., 2014). The associations between higher mindfulness and positive psychological outcomes also has been found for body image.

Research on the relation between mindfulness and body satisfaction is very recent. However, the few existing studies have shown that higher mindfulness is related to higher body satisfaction (Dijkstra & Barelds, 2011; Dekeyser, Raes, Leijssen, Lysen, & Dewulf, 2008; Prowse et al., 2013). In particular, correlational findings show that higher body satisfaction is related to lower *observing*, but higher *describing*, *acting with awareness*, and *accept without judgment* (Dijkstra & Barelds, 2011; Prowse et al., 2013). One study found that after controlling for eating disorder symptomatology, only low levels of *observing* and high levels of *describing*

are predictive of body satisfaction (Prowse et al., 2013). Thus, it seems that the association between mindfulness and body satisfaction is somewhat more complex than higher global mindfulness being associated with higher body satisfaction and that all five facets of mindfulness must be considered for a full understanding of this relation.

Despite demonstrated correlations between mindfulness and body satisfaction, there is limited evidence showing that mindfulness interventions can effectively improve body satisfaction. Although three intervention studies have been conducted, their results are mixed. For example, Alberts, Thewissen, and Raes (2012) found that an eight-week mindfulness-based cognitive therapy program significantly reduced food cravings, eating for reasons other than hunger, and concerns about body image. Additionally, another study found that a mindfulness-based intervention compared to a control group reduced weight and shape concern, as well as eating pathology (Atkinson & Wade, 2014). Yet, Luethcke, McDaniel, and Becker (2011) found that a mindfulness-based intervention improved weight and shape concern as well as eating disorder pathology, but did not increase body parts satisfaction. However, the implications of this study's results may be limited as mindfulness was not described to participants with the standard method. Specifically, participants only were told to focus on non-judging and awareness of present moment, but given no instruction on observing, describing, or non-reactivity. As observing is related to higher pathology in inexperienced meditators (Baer et al., 2006), it is important to provide direction on this facet. The findings from Alberts et al. (2012) may be somewhat more reliable, as their mindfulness-based intervention was more inclusive than the intervention employed by Luethcke et al. (2011). They instructed participants on three facets: *acting with awareness*, *non-judgment*, and *observing*. The intervention used by Atkinson and Wade (2014) was the most comprehensive; participants received instruction on observing and

describing thoughts and feelings, non-judgment of thoughts and feelings, and acknowledging and accepting negative thoughts about their body.

Based on the evidence thus far, it seems that mindfulness interventions can improve body image significantly. However, there are very few studies supporting this conclusion, and one study (Luethcke et al., 2011) had somewhat contradictory findings. In order to try to develop more effective interventions, it is important to consider how mindfulness may be related to body satisfaction: what is the mechanism, or mechanisms, by which mindfulness leads to improved body satisfaction?

Dijkstra & Barelds (2011) found that *non-judgment* is a central feature of mindfulness, and that it also is related to body image; thus, it seems that being mindful is associated with body satisfaction simply through low judgment. However, there may be more to the association than proposed. *Non-judgment* as a facet of mindfulness refers to the non-judgment of thoughts and experiences, and does not necessarily mean that there is no judgment of the object of thoughts, in this case appearance. Thus, *non-judgment* may consist of not judging negative appearance thoughts which themselves may vary in intensity or frequency.

Three other facets of mindfulness, *observing*, *describing*, and *acting with awareness*, also are associated with body satisfaction (Prowse et al., 2013). *Describing* involves labelling thoughts and feelings with words (Baer et al., 2006). *Describing* may be related to higher body satisfaction because if one is trying to describe how their negative appearance-related thoughts make them feel, then they are confronting such thoughts instead of avoiding them. Confronting negative appearance thoughts may decrease the distress associated with them, through a habituation effect, thus increasing body satisfaction.

*Acting with awareness* involves focussing attention on present moment experiences, such as thoughts and feelings (Baer et al., 2006). It precludes automatic responses to experiences; instead it promotes considering fully each experience as it occurs. *Acting with awareness* may be related to higher body satisfaction because it may prevent automatic negative thoughts about appearance, as it involves attending to experiences, rather than reacting automatically. Furthermore, when negative appearance thoughts do occur, focussing on them may result in less distress associated with such thoughts through a habituation effect. This notion is similar to the theory posited by Jansen and colleagues (2016): repeated mirror exposure decreased body dissatisfaction because individuals became habituated to the parts of their body that they disliked.

*Observing* involves noticing present moment experiences, such as thoughts, feelings, sensations, or perceptions (Baer et al., 2006). It is the only facet that involves the awareness of external stimuli, such as sights and sounds, as well as internal stimuli. Thus, *observing* may be applied to appearance itself, or to negative thoughts and feelings about appearance. *Observing* may be related to lower body satisfaction because there is an increased focus on disliked aspects of appearance or on the negative thoughts about appearance. If these observations occur without a detached, objective stance afforded by the other mindfulness facets, then this may result in increased distress about appearance. Generally, those with little meditation experience are unable to observe their internal and external experiences in an impartial way (Baer et al., 2006), so higher *observing* likely would be related to lower body satisfaction in women without mindfulness training. Indeed, this is supported by Prowse and colleagues (2013), who found that higher *observing* was associated with lower body satisfaction. This also is consistent with Adams

et al. (2013), who propose that in order for *observing* to promote psychological health it must be combined with other aspects of mindfulness, such as *non-judgment* and *non-reactivity*.

Mindfulness also may relate to body satisfaction through the facet of *non-reactivity*, which entails acknowledging thoughts and experiences without becoming overwhelmed by, or reacting to them (Baer et al., 2006). Though there is no published research investigating the association between *non-reactivity* and body satisfaction, *non-reactivity* is positively associated with psychological well-being and negatively associated with indices of lower mental health (Baer et al., 2006, 2008). Therefore, non-reactivity may be positively associated with body satisfaction, such that if individuals experience negative thoughts about appearance, but do not react to them, these thoughts may become less distressing, through a habituation effect, thus improving body satisfaction.

The connections between the facets of mindfulness and body image still does not explain why body satisfaction is higher in more mindful individuals; that is, what is the specific mechanism by which higher mindfulness is related to higher body satisfaction? Some mechanisms have been explored for the association between mindfulness and other psychological outcomes; for example, environmental mastery, purpose in life, and self-regulation significantly mediate the relation between *non-judgment* and depressive symptoms and stress (Brown, Bravo, Roos, & Pearson, 2015). However, mediators of the relation between mindfulness and body satisfaction have yet to be explored.

### **1.3. Thought Suppression: A Possible Mechanism**

Thought suppression is the tendency to avoid cognitions that one views as intrusive or unwanted, because they are depressive, anxiety-producing, traumatic, or socially inappropriate (Wegner & Zanakos, 1994). Thought suppression is a coping strategy used when faced with

emotional distress, and some individuals are predisposed to using this strategy more than others. Engaging in thought suppression results in an increased frequency of the unwanted thoughts (Muris, Merckelbach, & Horselenberg, 1996). Furthermore, when thoughts are not suppressed, they naturally decay on their own; it is the very act of trying to suppress negative thoughts that prevents them from decreasing in frequency, because suppression requires maintained attention on the thoughts.

Thought suppression can increase the frequency of any thought, regardless of its content (Muris et al., 1996). However, individuals only tend to suppress thoughts that evoke emotional distress (Wegner & Zanakos, 1994). Paradoxically, this attempt at suppression increases distress because of the increased frequency of the unwanted thoughts. It thus follows that accepting negative thoughts without judgement, the antithesis of thought suppression, would reduce their frequency and therefore, their associated distress. Furthermore, not attempting to control or change one's thoughts directly precludes thought suppression, which again would lower the frequency of the thoughts, and ultimately result in less distress. Both of these processes suggest a relation between thought suppression and mindfulness.

### **1.3.1. Thought Suppression and Body Satisfaction**

Thought suppression is related to a variety of negative psychological outcomes, such as depression and anxiety (Wegner & Zanakos, 1994). Little research has focused directly on the effects of thought suppression on body satisfaction, though evidence documents the usual effect of thought suppression on body satisfaction. Harnden, McNally, and Jimerson (1997) found that telling women to suppress thoughts about weight, rather than instructing them to express such thoughts, resulted in an increase in verbalization of weight-related thoughts. Additionally, the tendency to engage in thought suppression is related to more frequent occurrence of bulimic

cognitions and symptoms, such as body dissatisfaction, bingeing, and compensatory behaviours such as purging and excessive exercise (Lavender, Jardin, & Anderson, 2009).

### **1.3.2. Thought Suppression and Mindfulness**

Two studies have demonstrated that high dispositional mindfulness is related to low general thought suppression (Baer, et al., 2006; Garland & Roberts-Lewis, 2013). Additionally, researchers have determined that increasing levels of mindfulness through meditation decreases the tendency to suppress thoughts (Bowen, Witkiewitz, Dillworth, & Marlatt, 2007).

### **1.3.3. Mindfulness, Thought Suppression, and Body Satisfaction**

In sum, low mindfulness is related to lower body satisfaction. Additionally, low mindfulness is associated with high thought suppression and high thought suppression is related to high verbalization of weight-related thoughts and bulimic symptoms. Thus, it is reasonable to assume that thought suppression is related to body satisfaction. Extending this assumption, it is possible that thought suppression may work in conjunction with dispositional mindfulness to predict body satisfaction. Specifically, it is possible that thought suppression mediates the relation between mindfulness and body satisfaction. Logically, the tendency to be mindful towards negative appearance thoughts should lead to fewer attempts to suppress these thoughts, as mindfulness involves acceptance and a lack of reactivity or judgement towards thoughts. Such acceptance precludes trying to control or change thoughts and reduces emotional distress, thereby decreasing the likelihood of engaging in thought suppression. Fewer suppression attempts should result in natural thought decaying and thus, fewer negative thoughts about appearance and ultimately, more body satisfaction, simply because of lower exposure to negative appearance thoughts. If this proposition was true, thought suppression would be one mechanism by which mindfulness would lead to higher body satisfaction.

Aside from thought suppression and mindfulness, several other variables are related to body satisfaction. As mentioned previously, depression is inversely correlated with body satisfaction (Rodgers et al., 2010). Additionally, self-esteem consistently has demonstrated strong positive correlations with body satisfaction. Finally, body mass index (BMI) also is related to body satisfaction, such that individuals with lower BMI tend to report higher body satisfaction (Neighbors & Sobal, 2007). Therefore, it is important to assess the effects of depression, self-esteem, and BMI, in order to isolate the effect of mindfulness on body satisfaction.

#### **1.4. The Proposed Research**

The aim of the proposed research is to expand on the current literature by investigating whether mindfulness serves as a protective factor against low body satisfaction and by exploring a possible mechanism for this relation. The research consisted of two studies. In the first study, thought suppression was tested as a mediator between dispositional mindfulness and body satisfaction. In the second study, mindfulness was investigated as a protective factor against low body satisfaction after focussing on a disliked part of the body; as mentioned previously, focussing on one's body lowers body satisfaction (Jansen et al., 2016). Additionally, the mediation model from Study 1 was expanded in Study 2 by testing the effects of a brief mindfulness induction on thought suppression and body satisfaction after focussing on a disliked body part. Thus, the results from Study 2 may strengthen any conclusions drawn from Study 1.

##### **1.4.1. Study 1 Overview**

Previous research has shown that mindfulness is associated with increased body satisfaction (Prowse et al., 2013), and the current study was designed to test the theory that propose that thought suppression acts as a mechanism in this relation. The more mindful



individuals are, the less likely they should be to attempt to suppress negative thoughts about body image, which should result in reduced frequency of the thoughts, and ultimately, higher body satisfaction.

In Study 1 each facet of mindfulness was tested in a different mediation model. Given that the facets of mindfulness differentially relate to body image (Prowse, Bore, & Dyer, 2013), I proposed that the facets *describing*, *acting with awareness*, *non-judgment*, and *non-reactivity* would be related to higher body satisfaction via lower thought suppression, whereas higher *observing* would be related to lower body satisfaction via higher thought suppression. Furthermore, explored indirect relations between the facets of mindfulness and body satisfaction via thought suppression.

Based on previous research (e.g. Prowse et al., 2013) and the theory of mindfulness as a construct, all facets of mindfulness were expected to relate to body satisfaction through thought suppression. However, two facets were expected to be most predictive of body satisfaction: *non-judgment* and *non-reactivity*. This is because both *non-judgment* and *non-reactivity* are considered to be operationalisations of acceptance (Baer et al., 2006). As body satisfaction in women generally is an acceptance of weight and shape (Sanftner, Ryan, & Pierce, 2009), it follows that *non-judgment* and *non-reactivity* would predict the most variance in body satisfaction.

**Non-judgement, thought suppression, and body satisfaction.** The first model tested was between *non-judgement* and body satisfaction, with thought suppression as a mediator. It was expected that by not labelling negative thoughts about appearances as “bad,” individuals may be less likely to attempt to suppress such thoughts. If the thoughts are not suppressed, they will naturally decline on their own; thus, there will be fewer negative thoughts about appearance.

Lower exposure to negative self-appearance thoughts were expected to result in higher body satisfaction.

**Non-reactivity, thought suppression, and body satisfaction.** The second model tested the association between *non-reactivity* and body satisfaction, with thought suppression as a mediator. It was theorized that by not becoming overwhelmed by, or reacting to, negative thoughts about appearance, individuals would be less likely to try to suppress such thoughts. Thus, negative thoughts about appearance were thought to occur less often, resulting in higher body satisfaction.

**Describing, thought suppression, and body satisfaction.** The third model tested the association between *describing* and body satisfaction, with thought suppression as a mediator. It was expected that by trying to describe how appearance-related thoughts are making them feel, individuals may be less likely to attempt to suppress such thoughts because they are confronting them rather than trying to avoid them. As a result, it was anticipated that negative thoughts about appearance should eventually decrease with a corresponding increase in body satisfaction.

**Acting with awareness, thought suppression, and body satisfaction.** The fourth model tested the association between *acting with awareness* and body satisfaction, with thought suppression as a mediator. *Acting with awareness* precludes automatic negative appearance thoughts. However, when these thoughts do occur, it was theorized that by deliberately focussing attention on negative appearance thoughts, and not engaging in automatic behaviours that would detract from focusing on the thoughts, individuals will become habituated to such thoughts. As a result, they will be less likely to try and avoid negative thoughts about their appearance, because the thoughts are less distressing. It was anticipated that this would result in fewer negative thoughts about appearance, which would cause body satisfaction itself to increase.

**Observing, thought suppression, and body satisfaction.** The fifth model tested the association between *observing* and body satisfaction, with thought suppression as a mediator. Based on the inverse relation between *observing* and positive psychological outcomes, it was theorized that by noticing negative thoughts about appearance, individuals would be more likely to attempt to suppress such thoughts, because they are distressing. As a result, negative thoughts about appearance were thought to occur more often, which would decrease body satisfaction. Additionally, *observing* applies not only to thoughts, but to the object of the thoughts, such as a disliked body part. Thus, it was proposed that by noticing the sensations and perceptions associated with disliked body parts, individuals may be more likely to try to suppress negative observations about their body. As a result, individuals would be more likely to attend to parts of their body they do not like, which would decrease body satisfaction.

#### 1.4.2. Study 2 Overview

In Study 2, the effects of a brief mindfulness induction on state thought suppression and body satisfaction after focussing on a disliked body part was tested. Previous research has demonstrated that briefly focussing on a disliked body part increases body dissatisfaction and feelings of unattractiveness (Jansen et al., 2016). The mindfulness induction was a brief mindfulness instruction developed by Adams et al. (2013), based on the work of Kabat-Zinn (1994, 2002) and Baer and colleagues (2006). This mindfulness induction has demonstrated a medium effect size in increasing body satisfaction in female college students (Adams et al., 2013).

Although previous research has established that more mindful individuals report higher levels of body satisfaction, it is unclear if a brief mindfulness induction can prevent acute decreases in body satisfaction after focussing on a negatively evaluated body part, as this has not

been investigated before (Luethcke et al., 2011; Alberts et al., 2012; Atkinson & Wade, 2014). It was anticipated that a brief mindfulness induction, compared to a relaxation control condition, would result in higher state body satisfaction after focussing on a disliked body part.

Furthermore, it was expected that individuals in the mindfulness condition would report less thought suppression after this task; this would further support the notion that thought suppression is a mechanism of association between mindfulness and state body satisfaction. The relaxation task is designed to increase physical relaxation by systematically releasing tension in different muscle groups (Vinci et al., 2014). It has been found to decrease negative affect and increase physical relaxation, with limited changes in state mindfulness; thus, a relaxation induction is a suitable control for a mindfulness induction.

Additionally, the protective effect of mindfulness against decreases in body satisfaction was tested in Study 2. Levels of body satisfaction were compared between those who write about a disliked body part to those who write about weather that they do not like. It was anticipated that writing about a disliked body part would result in lower body satisfaction than writing about disliked weather, and that a relaxation induction would have a minimal effect on this.

Additionally, it was expected that a mindfulness induction would be effective at increasing the lowered body satisfaction resulting from writing about a disliked body part, which would demonstrate that mindfulness serves as a protective factor against lowered body satisfaction. Focussing on disliked weather was intended to induce negative feelings, just as focussing on disliked body parts does (Jansen et al., 2016), thus it was an appropriate control for the body focussed writing task.

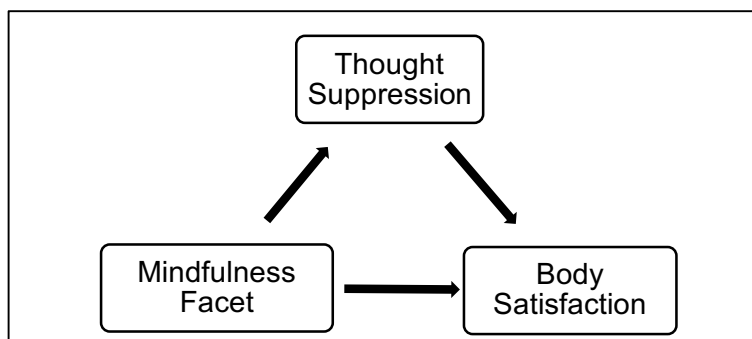
### 1.4.3. Research Questions

The proposed research was designed to answer four questions: First, are the relations between facets of mindfulness and body satisfaction mediated by thought suppression? Second, do either of the *non-judgement* or *non-reactivity* facets explain more variance in thought suppression, and therefore body satisfaction, compared to the other facets of mindfulness? Third, does a brief mindfulness induction result in higher state mindfulness and lower state thought suppression than a relaxation induction? Fourth, does a writing about a disliked body part result in lower body satisfaction compared to writing about disliked weather? Finally, does a brief mindfulness induction prevent decreases in state body satisfaction after focussing on a disliked body part?

### 1.4.4. Research Hypotheses

Based on the review of the literature presented above, the following hypotheses were formulated:

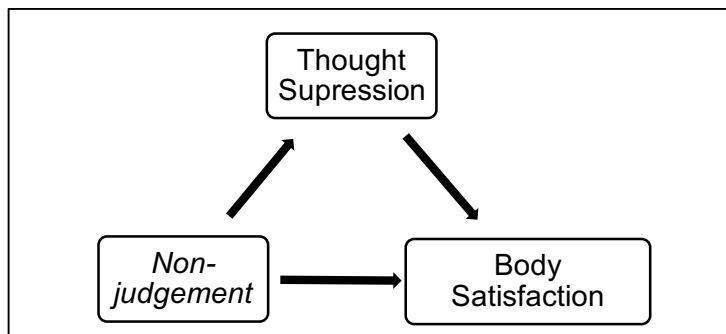
**Hypothesis 1a.** Higher levels of *describing*, *acting with awareness*, *non-reactivity*, and *non-judgment* will be associated with higher levels of body satisfaction, and these relations will be mediated by lower levels of thought suppression.



*Figure 1.* The proposed mediation model between mindfulness<sup>1</sup>, thought suppression, and body satisfaction.

**Hypothesis 1b.** Higher *observing* will be associated with lower body satisfaction, and this relation will be mediated by higher thought suppression.

**Hypothesis 2a.** The first mediation model involving *non-judgement* will explain more variance in body satisfaction compared to the three models involving the facets *observing*, *describing*, and *acting with awareness*.

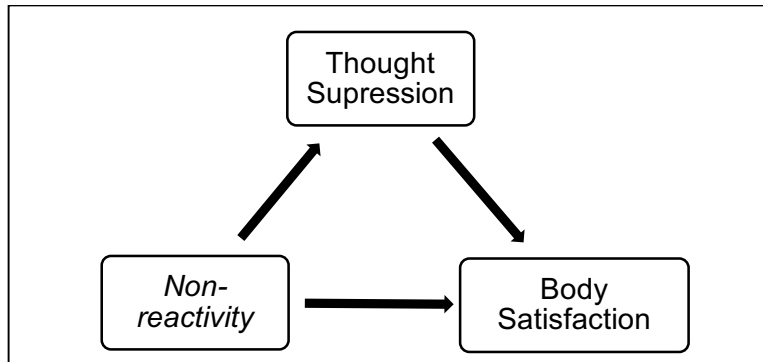


*Figure 2.* The proposed mediation model between *non-judgement*, thought suppression, and body satisfaction.

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<sup>1</sup> A separate mediation model is being proposed for each facet of mindfulness.

**Hypothesis 2b.** The second mediation model involving *non-reactivity* will explain more variance in body satisfaction compared to the three models involving the facets *observing*, *describing*, and *acting with awareness*.



*Figure 3.* The proposed mediation model between *non-reactivity*, thought suppression, and body satisfaction.

**Hypothesis 3.** Compared to a relaxation control induction, a brief mindfulness induction will result in higher state mindfulness and lower state thought suppression.

**Hypothesis 4.** Overall, writing about a disliked body part, compared to writing about unpleasant weather, will result in lower state body satisfaction.

**Hypothesis 5.** There will be an interaction between writing task and induction, such that there will be no differences in the participants' body satisfaction in the unpleasant weather condition whether they receive the mindfulness induction or relaxation induction. However, in the disliked body part condition, those who receive the mindfulness induction will report significantly higher body satisfaction than those who receive the relaxation induction.

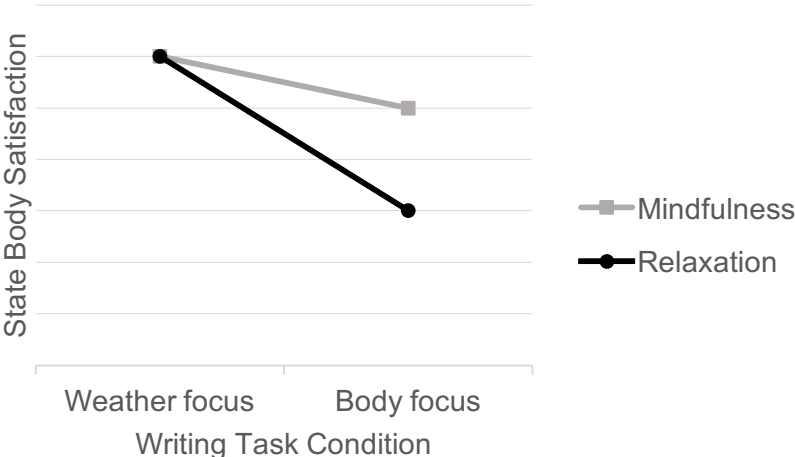


Figure 4. The proposed interaction between writing task condition and induction condition.



## 2. METHODS

### 2.1. Design

#### 2.1.1. Study 1

This was a correlational study with bootstrapping analyses to determine if thought suppression (mediating variable) explains the relation between facets of mindfulness (predictor variables) and body satisfaction (outcome variable). Body mass index, trait self-esteem, and depression were tested as covariates.

#### 2.1.2. Study 2

The second study was a controlled experiment and employed three separate 2x2 between group ANOVAs to test the third, fourth, and fifth hypotheses. The first independent variable is the writing task, either a body-focus or a weather-focus task. The latter was the control task. The second independent variable is the induction condition, either a mindfulness induction or a relaxation induction. The latter was the control condition. Thus, there were four separate groups in Study 2: Body focus/Mindfulness, Body focus /Relaxation, Weather focus/Mindfulness, and Weather focus/Relaxation. The dependent variables were state mindfulness and attempted thought suppression for hypothesis three, and state body satisfaction for hypotheses four and five.

### 2.2. Participants

**2.2.1. Power analysis.** In order to determine the required sample size for the present research, a power analysis was conducted using G\*power. The required sample size for the laboratory portion was determined, as attrition from the online to laboratory component was expected to be approximately 60%. Effect sizes from past literature were used; a mindfulness intervention was found to have a large effect on body image acceptance ( $d = 0.86, p < .05, 95%$

CI = 0.04, 1.68), when compared to a control group (Atkinson & Wade, 2014). In the same study, the mindfulness intervention had a moderate effect on body image acceptance when compared to a dissonance group ( $d = 0.50$ ,  $p < .05$ , 95% CI = -.37, 1.37). In another study, a single-session mindfulness intervention had a medium effect on body dissatisfaction (partial  $\eta^2 = .12$ ;  $p < .05$ , 95% CI = .0076, .278; Adams et al., 2013). Thus, in order to remain conservative, a moderate effect size was assumed. Using a moderate effect size, it was determined that 85 participants would be needed in the experiment to detect statistically significant effects. This number was rounded to 100 participants in case of missing or unusable data, or the withdrawal of consent. Based on a 60% attrition rate, this means that 250 participants were recruited for the proposed research.

### 2.2.2. Study 1

Participants for Study 1 were 248 women undergraduate students from the University of Windsor. Only women were included because body satisfaction for women and men manifests differently. Low body satisfaction for women typically stems from a desire to be thinner and more beautiful, but men are generally dissatisfied with their body because they are not as lean and muscular as the men portrayed in the media (Sanftner et al., 2009). Inclusion criteria were female sex and no past or current diagnosis of an eating disorder. These questions are part of the Participant Pool screening procedures, and those who indicated they were men or had a past or current eating disorder diagnosis were unable to see the study. Participants signed up for the study through the online participant pool and received course credit for their participation. The majority of participants were Caucasian (61%), reported no prior meditation experience (63%), had a mean age of 20.59 ( $SD = 3.01$ ), and an average BMI of 23.64 ( $SD = 5.23$ ).

### **2.2.3. Study 2**

Participants for Study 2 were 76 women undergraduate students who had participated in Study 1. Although participants signed up for both studies at once, most participants cancelled their timeslots for Study 2, upon completion of Study 1. Furthermore, several participants who retained their timeslot for Study 2 did not attend, and were considered “no-shows.”

### **2.3. Procedure**

Eligible students were invited to take part in the studies via an advertisement posted on the Participant Pool website (see Appendix O). The studies were advertised as one study consisting of two parts, so that the same students participated in both parts. The studies were visible only to female undergraduates without a past or current diagnosis of an eating disorder.

Participants signed up for both studies at once. The first study was conducted online and took approximately 60 minutes, after which, 1.0 bonus points was awarded. The second study then was conducted in the laboratory and took approximately 1 hour, after which the participants were awarded another 1.0 bonus points.

In order to minimize demand characteristics, participants were told that they were participating in research about personality and how people think about themselves. They also were told that in order to fully assess how personality influences self-perception, both online and laboratory sessions are necessary to give a better understanding of how these factors interact. The study also was advertised as teaching breathing techniques for stress reduction. As past research from this laboratory demonstrated difficulty for recruitment of in-lab experiments, this description was included to attract more participants.

Before any questionnaires were administered, participants selected a time slot for their laboratory session and then read and sign a consent form (see Appendix P). A maximum of two

participants could sign up for each timeslot. These sessions took place 1 to 2 weeks after the online survey. The time slots were randomized ahead of time so that participants were in one of the four conditions: Weather focus/Mindfulness, Weather focus/Relaxation, Body focus/Mindfulness, or Body focus/Relaxation.

### **2.3.1. Procedure Study 1**

After selecting their time slots, participants were guided to the online survey. The first page was the Consent to Participate in Online Research form (Appendix P), which contained the purpose and procedures of the study, as well as any known risks and benefits. Participants indicated informed consent by selecting “I agree” at the bottom of the web page. After providing consent, participants continued the survey, which consisted of the following questionnaires: demographics, the Five Facet Mindfulness Questionnaire (FFMQ), the White Bear Suppression Inventory (WBSI), the Body Areas Satisfaction Scale (BASS) of the Multidimensional Body Self-Relations Questionnaire (MBSRQ), the Rosenberg Self-Esteem Scale (RSES), and the Beck Depression Inventory-II (BDI-II). To prevent order effects, the last six questionnaires were randomized in the online survey. For the online portion of the study, BMI was assessed as a separate question at the end of the study.

### **2.3.2. Procedure Study 2**

In order to prevent attrition, participants were sent an e-mail or text reminding them of their timeslot two days before their lab session. When participants came into the laboratory, each individual was guided to a separate room equipped with a computer. Participants individually completed Study 2 to ensure that their answers were independent of one another, as this is an assumption of the statistical test used to analyse the data from Study 2 (Field, 2009). With the exception of obtaining height and weight, the entire second portion of the study was completed

on the laboratory computers. This was to ensure that the instructions and experimental manipulations were administered in a standardized manner.

The first page of the survey was the consent form, which participants were instructed to re-read, in order to establish ongoing consent. Next, they completed the Toronto Alexithymia Scale-20 and the Satisfaction with Life Scale as distraction measures, in order to prevent hypotheses guessing. To prevent order effects the sequence of these two questionnaires was counterbalanced. The survey program (FluidSurveys) was configured so that participants were randomly assigned to given either the body-focus group or the weather-focus group. Participants in the body-focus group were asked to type on the laboratory computer about a part (or parts) of their body that they dislike for five minutes. Prompts were given to help the participants write as much as they could about the disliked body part. Prompts included items such as “why don’t you like the body part?” and “what is it about the body part that you dislike?” (see Appendix Q for complete list of prompts). Participants in the weather-focus group were asked to type on the laboratory computer about weather that they do not like. Prompts were given to help the participant write as much as they could about the weather. Prompts included items such as “why don’t you like that weather?” and “what is it about that weather that you dislike?” (see Appendix R for full list of prompts). This was the manipulation of the first independent variable, type of writing task.

Once more, the survey software was used to randomly assign participants to either the mindfulness or relaxation induction groups. The participants were guided to a separate page that had an audio recording made by the experimenter. Participants were told that they are going to engage in a focussed breathing task. They were instructed on how to sit for the duration of the exercise. Those in the mindfulness condition were given a mindfulness induction (see Appendix

S), in which participants were instructed to direct their attention to their breathing, without trying to change or control it. They also were told that if they have any other thoughts, they should acknowledge these thoughts without judgment or any attempts to control or change the thoughts; they should just gently bring their focus back to their breathing.

Those in the relaxation condition were given a relaxation induction (see Appendix T). They were told to take deep breaths and progressively relax their muscles. Participants were instructed to relax the muscles in their right hand and arm, working their way over to their left arm and to their face. They continued relaxing muscles throughout their body, eventually ending by relaxing the muscles in their feet. No instruction on mindfulness attention were given. This was the manipulation of the second independent variable, type of induction. Both the mindfulness induction and the relaxation induction have been used in previous studies and have had significant effects on state mindfulness and state relaxation, respectively (Adams et al., 2013; Vinci et al., 2014). Additionally, in a study by Vinci and colleagues (2014), the mindfulness induction resulted in higher state mindfulness than the relaxation induction.

After the manipulation, participants were given a state measure of mindfulness (TMS). They also were given a measure of affect (PANAS) to determine if the manipulations resulted in participants reporting similar affect. Then they were given a state measure of body satisfaction (BISS) and asked how many times they thought about the disliked body part or weather and how hard they tried to suppress these thoughts, on a scale of one to 10. The order of the PANAS and BISS was counterbalanced to prevent order effects.

Once the participants completed the final measures, a post-study information letter was provided (see Appendix U), which was used to explain the purpose of both parts of the study. The experimenter also verbally debriefed participants using the post-study information letter.

After this, participants were told that obtaining their height and weight is an important part of the study. Those who agreed were given an additional consent form (see Appendix V), and their height and weight was measured in the lab to provide a precise BMI. This was to prevent inaccuracy associated with self-reporting of height and weight for the experimental portion of the study. Participants were asked to remove their shoes and outdoor clothing prior to measuring their height and weight. Measurements were taken in the winter, in the morning or afternoon.

### **2.3.3. Pilot Testing**

To determine the feasibility of Study 2, the procedure was piloted approximately one month before the study was available to students in the Participant Pool. This was done to ensure that the body-focussed writing task reduced body satisfaction. The pilot test also assessed whether the mindfulness manipulation resulted in higher state mindfulness than the relaxation instruction. Finally, the pilot test was used to determine if participants understood and could respond to the questions assessing state thought suppression, as these exact questions were not used in previous research. Twenty students from the Pool were recruited for the pilot testing.

The procedures for the pilot testing were the same as outlined above for Study 2, with a few exceptions. After receiving the post-study information letter, participants in the pilot test were asked about the writing task and induction. Specifically, those in the body-focus group were asked whether the writing task was easy to complete and made them think about disliked aspects of their body. Several participants reported that the task was not very effective, as they wrote only one or two words; thus, participants in Study 2 explicitly were instructed to write for the entire five minutes provided, and that it was important to write as much as possible.

Furthermore, participants in both intervention groups were asked whether the inductions were

too long/too short and easy to follow. All participants reported that they were satisfied with the induction, thus, no modifications were made for Study 2.

## 2.4. Measures

See Table 1 in the Results for descriptive statistics for all measures.

### 2.4.1. Demographics Questionnaire

Participants completed a brief demographics questionnaire (see Appendix A) to determine age, ethnicity, and previous diagnosis of an eating disorder. Questions about previous meditation experience or other types of meditative practices, such as yoga, were included to ensure that the participants in the four experimental conditions had equivalent meditation experience.

**Past meditation experience.** Past meditation experience was assessed using the following the questions: “Have you ever practiced meditation before?”, “Have you ever engaged in meditative-type practices before, such as yoga?”, “Have you ever engaged in contemplative-type practices before, such as prayer, rosary, or misbaha?”, and “Have you ever received dialectical behavioural therapy (DBT) before?” These questions were included, as these practices have been associated with increases in mindfulness (de Castro, 2015; Perroud, Nicastro, Jermann, & Huguelet, 2012). Thus, participants who reported engaging in these practices may have had higher mindfulness than those who did not. Participants who answered “yes” to any of these questions were coded as 1, and those who answer “no” to all of these questions were coded as 0. An ANOVA was used to ensure these groups did not score statistically different on the measure of mindfulness administered in Study 2.



### 2.4.2. Independent Variable Measure

**Five Facet Mindfulness Questionnaire (FFMQ).** The FFMQ evaluates five different aspects of mindfulness: *observing* (noticing) internal and external experiences, *describing* (labelling) internal experiences such as thoughts and feelings, *acting with awareness* in present-moment activities, *non-judging* of internal experiences, and *non-reactivity* to inner experiences (Baer et al., 2006; see Appendix B).

The FFMQ consists of 39 items such as “I’m good at finding words to describe my feelings” and “I find it difficult to stay focused on what’s happening in the present moment.” All items are answered on a scale, ranging from 1 (*never or very rarely true*) to 5 (*very often or always true*). Half of the items are scored such that low scores indicate higher mindfulness; these items are reverse-scored before obtaining total mindfulness scores. The other half of items are scored such that high scores indicate high mindfulness.

The FFMQ has good convergent validity, demonstrated by the negative correlation between the facets *describing*, *non-judging*, *acting with awareness*, and *non-reactivity*, and thought suppression and neuroticism ( $r$ s ranging from  $-.23$  to  $-.56$ ). Additionally, there are positive correlations between all facets of the FFMQ and self-compassion and emotional intelligence ( $r$ s ranging from  $.14$  to  $.60$ ; Baer et al., 2006). In the present study, the FFMQ demonstrated good internal consistency, with Cronbach’s alpha coefficients ranging from  $.74$  to  $.91$  for the different facets.

### 2.4.3. Mediating Variable Measure

**White Bear Suppression Inventory (WBSI).** The WBSI is a trait measure assessing the tendency to suppress thoughts (Wegner & Zanakos, 1994; see Appendix C). There are 15 items such as “I have thoughts I cannot stop,” which are answered on a scale ranging from 1 (*strongly*

*disagree*) to 5 (*strongly agree*). Scores are summed to yield a total score between 15 and 75, with higher scores indicating a stronger tendency to suppress thoughts.

Scores on the WBSI are stable over time ( $r$ s ranging from .69 to .92), indicating good test-retest reliability. Scores on the WBSI are positively correlated with scores of obsessive thinking, anxiety, and depression ( $r$ s ranging from .38 to .58), thereby demonstrating convergent validity (Wegner & Zanakos, 1994). In the present study, the WBSI demonstrated high internal consistency with a Cronbach's alpha of .93.

#### **2.4.4. Dependent Variable Measures**

##### **Multi-dimensional Body Self Relations Questionnaire; Body Appearance**

**Satisfaction Scale (BASS).** The BASS is a 9-item scale designed to assess satisfaction with specific body parts or attributes, such as face, legs, waist, and weight (Cash, 2000; see Appendix D). Items are scored on a scale ranging from 1 (*very dissatisfied*) to 5 (*very satisfied*). Scores are summed to yield a total, and higher scores indicate higher body satisfaction. The BASS also has a one-month test-retest reliability of  $r = .74$  in college females, indicating that scores tend to remain stable over time (Cash, 2000). In the present study, the BASS had good internal consistency with a Cronbach's alpha of .85.

##### **Multi-dimensional Body Self Relations Questionnaire; Appearance Evaluation Scale**

**(AES).** The AES assesses satisfaction with global appearance using seven items, such as "I like my looks just the way they are" (Cash, 2000; see Appendix E). Items are scored on a scale ranging from 1 (*definitely disagree*) to 5 (*definitely agree*); scores are summed to yield a total and higher scores indicate more satisfaction with appearance. The AES also has a one-month test-retest reliability of  $r = .91$  in college females, indicating that scores remain stable over time

(Cash, 2000). In the present study, the AES demonstrated good internal consistency, with a Cronbach's alpha of .90.

**Body Image States Scale (BISS).** The BISS is a self-report measure designed to assess state body image satisfaction, including perceived attractiveness, appearance compared to others, body shape and size, and body weight (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002; see Appendix F). There are 6 items, scored on a 9-point scale. Higher scores indicate higher state body satisfaction. Additionally, the BISS demonstrates acceptable two or three-week test-retest reliability of  $r = .69$  in university women. Convergent validity was demonstrated by a positive correlation between scores on the BISS and a trait measure body satisfaction ( $r = .78$ ), and negative correlations between BISS and measures of body dissatisfaction and BMI ( $r$ s ranging from  $-.28$  to  $-.56$ ; Cash et al., 2000). In the present study, the BISS had good internal consistency, with Cronbach's alpha of .81.

**Toronto Mindfulness Scale (TMS).** The TMS is a self-report measure of state mindfulness with two subscales: *curiosity* towards present moment experiences and *decentering*, which involves being aware of experiences without being overwhelmed by them (Lau et al., 2006; see Appendix G). The TMS consists of 13 questions that are answered on a scale ranging from 0 (*not at all*) to 4 (*very much*). Items are statements such as "I noticed thoughts come and go." Higher scores indicate higher state mindfulness.

The TMS has convergent validity, as demonstrated by positive correlations between scores on the TMS and scores with another state measure of mindfulness, the State Mindfulness Scale ( $r$ s ranging from  $.31$  to  $.43$ ; Tanay & Bernstein, 2013). In the present study, the TMS demonstrated good internal consistency, with Cronbach's alpha of .83.

The TMS does not assess the same components of mindfulness as the FFMQ and is a state measure of mindfulness, whereas the FFMQ is a trait measure. Thus, these two scales were used for different purposes in the present research.

**State Thought Suppression (Experimenter Designed).** State thought suppression, or how often the participants try to suppress negative thoughts during a ten-minute period, was assessed using two questions (see Appendix H). The first assessed the frequency of negative thoughts: “How many times during the breathing exercise did you think about the body part you disliked, or about parts of your body you dislike in general?” The second question assessed how hard the participants tried to suppress such thoughts: “On a scale of 1 to 10, with 1 being *not at all* and 10 being *as hard as you could*, how much did you try to avoid or suppress negative thoughts about your body image during the breathing exercise?” Higher scores on this question indicate a greater attempt to suppress negative body image thoughts. For those in the weather-focus groups, these questions will be re-worded to ask about weather-related thoughts (see Appendix H).

Although these questions have not been validated as a way to assess state thought suppression, Schmidt and Gendolla (2008) assessed the frequency of target thoughts by asking participants either to verbalize when they had the thought, record on a hand-held counter when they had the thought, or mark a tick on a piece of paper when they had the thought. In the present study, participants were asked to retrospectively report the number of target thoughts, rather than prospectively, so that they could devote their full attention to the induction. Furthermore, Beck, Gudmundsdottir, Palyo, Miller, and Grant (2006) used a similar question to Item 2 in a study assessing thought suppression in individuals who had posttraumatic stress disorder as a result of a motor vehicle crash. Participants were instructed to specifically suppress thoughts about motor

vehicle accidents and then asked to rate, on a scale from 0 = *unsuccessful* to 100 = *completely successful*, their perceived success at suppressing such thoughts. As it is attempted thought suppression, rather than successful thought suppression, that is being investigated in the current study, the aforementioned questions were deemed more appropriate for use in this study.

#### **2.4.5. Covariate Measures**

Three additional variables were measured in order to separate their effects on body dissatisfaction from those of mindfulness and thought suppression. These are global self-esteem, depression, and BMI.

**Rosenberg Self-Esteem Scale (RSES).** The RSES is a 10-item measure of global trait self-esteem (Rosenberg, 1965; see Appendix I). Items such as “On the whole I am satisfied with myself” are answered on a 4-point scale from 1 (*strongly agree*) to 4 (*strongly disagree*). Items are summed to obtain a total, with higher scores reflecting higher trait self-esteem. In the present study, the RSES had acceptable internal consistency, with a Cronbach's alpha of .72.

**Beck Depression Inventory – Second edition (BDI-II).** The BDI-II is 21-item self-report questionnaire assessing the severity of depressive symptoms (Beck, Steer, & Brown, 1996; see Appendix J). The BDI-II measures symptoms such as “Sadness” and “Suicidal Thoughts and Wishes.” There are four responses for each item, indicative of the degree to which the individual experienced the symptom during the past two weeks, with 0 indicating an absence of that symptom and 3 indicating a severe level of that symptom. Items are summed to obtain a total and higher scores indicate more depressive symptoms. In the present study, the BDI-II had Cronbach's alpha of .92 for the BDI-II, indicating high internal consistency.

**Body Mass Index (BMI).** BMI was calculated by dividing body weight (kilograms) by height (meters) squared (see Appendix K). In Study 1, this information was collected using

separate questions at the end of the online questionnaire. In Study 2, this information was empirically gathered by measuring the height and weight of participants while they were in the laboratory. A standard tape measure was used to measure height and a scale (Weight Watchers scale, model WW39BWC) was used to measure weight. Height and weight were measured empirically, because while correlations between estimated and actual height and weight are high, women tend to underreport their weight and overreport their height (Meyer, McPartlan, Sines, & Waller, 2009). Self-reported height and weight still were assessed in Study 1 so that the BMI could be calculated for participants who did not attend the laboratory portion.

#### **2.4.6. Distraction Measures**

**Toronto Alexithymia Scale-20 (TAS-20).** The TAS-20 is a 20-item self-report measure of alexithymia, which is typically described as difficulty identifying and communicating emotions (Bagby, Parker, & Taylor, 1994; see Appendix L). Items such as “I have feelings that I can’t quite identify” are rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items are summed to obtain a total score; higher scores indicate higher levels of alexithymia. In the present study, the TAS-20 had a Cronbach’s alpha of .73, indicating acceptable internal consistency.

**Satisfaction with Life Scale (SWLS).** The SWLS is a 5-item self-report measure of life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985; see Appendix M). Items such as “In most ways, my life is close to ideal” are scored on a 7-point scale ranging from 1 (strongly disagree) to 7 (strong agree). Items are summed to obtain a total score; higher scores indicate greater life satisfaction. In a sample of university students, the SWLS has a 2-month test-retest correlation of .82, indicating good test-retest reliability. In the present study, the SWLS has a Cronbach’s alpha of .81, demonstrating good internal consistency.

#### **2.4.7. Post-Manipulation Affect Check**

**Positive and Negative Affect Schedule (PANAS).** The PANAS is a 20-item self-report measure of affect (Watson, Clark, & Tellegen, 1988; see Appendix N). Respondents rate the degree they feel each emotion *right now* on a scale from 1 (*very slightly or not at all*) to 5 (*extremely*). There are 10 negative affect items such as “hostile” and “distressed” and 10 positive affect items such as “enthusiastic” and “determined.” In the present study, the Positive Affect and Negative Affects scales of the PANAS had acceptable internal consistency, with Cronbach’s alphas of .91 and .73, respectively. The PANAS was used in the proposed research as a post-manipulation affect check, to ensure that participants in the two induction groups report similar levels of positive affect.

### **3. RESULTS**

#### **3.1. Data Inspection and Cleaning**

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 23.0. The first two hypotheses were tested using a mediated multiple regression analysis (MRA). The third, fourth, and fifth hypotheses were tested using three 2x2 ANOVAs. Prior to hypothesis testing, missing data were addressed, and then the assumptions of MRA and ANOVA were tested.

##### **3.1.1. Invalid Responses**

Items intended as validity checks were inserted into the FFMQ, WBSI, TAS-20, and TMS, in order to evaluate random or inattentive responding. These items were: “Please answer Somewhat Frequently to this item,” “Please answer Often True to this item,” and “Please answer Very Much to this item.” If a participant answered incorrectly more than one of these items, their data were considered invalid and removed from the data set. If participants answered only one of

these items incorrectly, their responses on other scales were examined. If they carelessly responded on at least one measure, for example, they selected response option 3 for all items, their data were considered invalid and they were excluded from the data set.

For Study 2, responses also were considered invalid if the total time taken to complete Study 2 was less than 15 minutes. The writing task was five minutes and the induction required 10 minutes. Thus, if a participant completed Study 2 in less than 15 minutes, it suggested that they did not participate in the full induction and their data were considered invalid.

In Study 1, 14 cases were deemed to have provided invalid data based on the validity checks. Therefore, the final sample size was 234. In Study 2, seven cases were deemed to have provided invalid data based on the validity checks; the final sample size 69.

### **3.1.2. Missing Data**

For Study 1, there was less than 1% missing data. Missing data were replaced using multiple imputation procedures in SPSS. Due to technical difficulties in Study 2, answers for the questions assessing state thought suppression were not saved for approximately half of the participants. Thus, state thought suppression was removed from the analyses. Aside from state thought suppression, there were no other missing data from Study 2.

### **3.1.3. MRA Assumptions**

The first assumption of MRA is normality of residuals. That is, if the distance of each data point from the regression line were to be plotted, these distances would be normally distributed (Cohen, Cohen, West, & Aiken, 2015). To assess this assumption, the residuals were plotted using a normal *q-q* plot. In *q-q* plots, straight lines are used to assess normality: if the residuals follow a straight line, then they are normally distributed. In the present dataset, scores followed a straight line, suggesting that the residuals had a normal distribution. Additionally, the



Kolmogrov-Smirnov test statistic was non-significant (.044,  $p = .200$ ), further suggesting that the distribution of residuals was normal.

Outliers on the predictor variables (*non-judgement, non-reactivity, describing, observing, and acting with awareness*) and the outcome variable (body satisfaction) were assessed (Cohen et al., 2015). A conservative cut-off value of  $|3.0|$  standard deviations yielded six univariate outlying values. These scores were replaced with the participants' next highest non-outlying score on the measure to which the missing value belonged (Field, 2009). There were no multivariate outliers.

In order to use MRA, the distribution of residuals must have equal variance for all predicted values of body satisfaction; this is the assumption of homoscedasticity (Cohen et al., 2015). To test this, the residual plots and bivariate scatter plots were examined for each predictor variable. For the majority of predictor variables, the data points fell in a random pattern around the horizontal zero point, indicating a homoscedastic distribution of residuals.

Finally, multicollinearity and singularity of the predictor variables were assessed using tolerance values for each predictor variable (Cohen et al., 2015). All tolerance values were greater than .20, suggesting that the variables were sufficiently distinct to use MRA.

#### **3.1.4. ANOVA Assumptions**

The first assumption of ANOVA is that the scores on the dependent variable are normally distributed (Field, 2009). This was tested through the Kolmogrov-Smirnov test of normality. State mindfulness and state body dissatisfaction scores were normally distributed ( $ps = .200$ ). The second assumption is that the variance in scores between the two groups is approximately equal. This was tested using Levene's test of inequality of error variances. Significance values for all variables were  $p > .05$ , indicating homogeneity of variances (Field, 2009).

The final assumption is that the observations are independent of each other; that is, each participant's scores are independent of other participants' scores (Field, 2009). This cannot be determined statistically for an ANOVA, but rather through careful consideration of the methods. In this case, each participant completed the study in a different room, thus, it is unlikely that one participant's scores influenced another's.

### 3.2. Descriptive Statistics

Table 1.

*Descriptive Statistics for All Measures.*

Study 1	Mean(SD)		
Observe	3.31(.63)		
Describe	3.20(.80)		
Acting with Awareness	2.98(.72)		
Non-judgment	3.00(.84)		
Non-reactivity	2.93(.59)		
Body Satisfaction	3.33(.79)		
Thought Suppression	3.51(.82)		
Depression	38.23(13.06)		
BMI	23.64(5.22)		
Study 2	Overall M(SD)	Relaxation Group M(SD)	Mindfulness Group M(SD)
State Mindfulness	3.00(.70)	3.03(.63)	2.96(.78)
State Body Satisfaction	5.23(1.44)	5.26(1.46)	5.21(1.44)
Positive Affect	2.23(.80)	2.21(.82)	2.26(.78)

### 3.3. Study 1

#### 3.3.1. Main Analyses

In order to test the first two hypotheses, separate mediated MRAs were conducted for each predictor variable, using the PROCESS macro from Hayes (2013). This macro enables SPSS to perform mediation analyses while testing multiple predictors simultaneously. The predictor variables (*non-judgement*, *non-reactivity*, *observing*, *describing*, or *acting with*

*awareness*), mediator variable (thought suppression), covariates (depression, self-esteem, and BMI), and outcome variable (body satisfaction) were entered into the mediation equation.

PROCESS generates bootstrapped 95% confidence intervals for the indirect effects; an interval that does not include both positive and negative numbers means that the effect is statistically significant. PROCESS also provides  $R^2$  as an estimate of effect size for both the direct and indirect effects. The model or models that explains the most variance in body satisfaction were identified to test the second hypothesis.

**Describing.** Hypothesis 1a: It was hypothesised that higher *describing* would be associated with higher body satisfaction, and that this relation would be mediated by lower thought suppression. *Describing* was a significant predictor of body satisfaction  $B = .131$  ( $SE = .058$ ),  $p = .025$ , 95% CI [.017, .045], and was inversely related to thought suppression,  $B = -.367$  ( $SE = .063$ ),  $p < .001$ , 95% CI [-.491, -.242]. However, thought suppression did not mediate the relation between describing and body satisfaction,  $B = -.000$  ( $SE = .024$ ), 95% CI [-.048, .049]. All covariates were significant predictors of body satisfaction ( $ps < .001$ ).  $R^2$  for this model was .339, indicating that describing, depression, self-esteem, and BMI account for 34% of the variance in body satisfaction scores (Hypotheses 2a/b).

**Acting with Awareness.** Hypothesis 1a: It was hypothesised that higher *acting with awareness* would be associated with higher body satisfaction, and that this relation would be mediated by lower thought suppression. *Acting with awareness* was a significant predictor of body satisfaction,  $B = .142$  ( $SE = .070$ ),  $p = .04$ , 95% CI [.005, .280]. and was inversely related with thought suppression,  $B = -.509$  ( $SE = .067$ ),  $p < .001$ , 95% CI [-.642, -.377]. However, acting with awareness was not indirectly related to body satisfaction via thought suppression,  $B = -.001$  ( $SE = .033$ ), 95% CI [-.067, .065]. All covariates were significant ( $ps < .001$ ).  $R^2$  for this

model was .336, indicating that acting with awareness, depression, self-esteem, and BMI account for 34% of the variance in body satisfaction scores (Hypotheses 2a/b).

**Non-Judging.** Hypothesis 1a: It was hypothesised that higher *non-judging* would be associated with higher body satisfaction, and that this relation would be mediated by lower thought suppression. *Non-judging* was a significant predictor of body satisfaction,  $B = .215$  ( $SE = .070$ ),  $p = .002$ , 95% CI [.077, .352] and was inversely related to thought suppression,  $B = -.662$ , ( $SE = .048$ ),  $p < .001$ , 95% CI [-.755, -.568]. However, thought suppression did not mediate the relation between describing and body satisfaction,  $B = -.060$  ( $SE = .046$ ), 95% CI [-.151, .029]. All covariates were significant ( $ps < .001$ ).  $R^2$  for this model was .351, indicating that non-judging, depression, self-esteem, and BMI account for 35% of the variance in body satisfaction scores (Hypothesis 2a).

**Non-Reactivity.** Hypothesis 1a: It was hypothesised that higher *non-reactivity* would be associated with higher body satisfaction, and that this relation would be mediated by lower thought suppression. *Non-reactivity* was not a significant predictor of body satisfaction,  $B = -.023$  ( $SE = .078$ ),  $p = .76$ , 95% CI [-.176, .129]. However, it was inversely related to thought suppression,  $B = -.483$  ( $SE = .085$ ),  $p < .001$ , 95% CI [-.651, -.316]. *Non-reactivity* was not indirectly related to body satisfaction via thought suppression,  $B = .017$  ( $SE = .032$ ), 95% CI [-.041, .085]. All covariates were significant predictors of body satisfaction ( $ps < .001$ ).  $R^2$  for this model was .324, indicating that non-reactivity, depression, self-esteem, and BMI account for 32% of the variance in body satisfaction scores (Hypothesis 2b).

**Observing.** Hypothesis 1b: It was hypothesised that higher *observing* would be associated with lower body satisfaction, and that this relation would be mediated by higher thought suppression. *Observing* was not a significant predictor of body satisfaction,  $B = .084$

( $SE = .069$ ),  $p = .22$ , 95% CI [-.051, .219]. Additionally, observing was not significantly related to thought suppression,  $B = .134$  ( $SE = .085$ ),  $p = .11$ , 95% CI [-.033, .301]. Finally, observing was not indirectly related to body satisfaction via thought suppression  $B = -.005$  ( $SE = .011$ ), 95% CI [-.040, .009]. All covariates were significant predictors of body satisfaction ( $ps < .001$ ).  $R^2$  for this model was .329, indicating that observing, depression, self-esteem, and BMI account for 33% of the variance in body satisfaction scores (Hypotheses 2a/b).

Table 2. *Path Estimates and Effect Sizes for the Direct and Indirect Effects of Mindfulness on Body Satisfaction.*

Facet	Effect of Mindfulness on Thought Suppression B(SE)	Effect of Thought Suppression on Body Satisfaction B(SE)	Effect of Mindfulness on Body Satisfaction B(SE)	$R^2$
Describing	<b>-.367(.063)</b>	-.001(.065)	<b>.131(.058)</b>	.339
Act Aware	<b>-.509(.067)</b>	.001(.066)	<b>.142(.070)</b>	.336
Non-Judging	<b>-.662(.048)</b>	.091(.074)	<b>.215(.070)</b>	.351
Non-Reactivity	<b>-.483(.085)</b>	-.036(.066)	-.023(.078)	.324
Observing	.134(.085)	-.038(.391)	.084(.069)	.329

Note: **bolded** values indicate significant effects. Act Aware = acting with awareness.

Table 3. *95% Confidence Intervals for the Direct and Indirect Effects of Mindfulness on Body Satisfaction.*

	95% CI for Direct Effect		95% CI for Indirect Effect	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Describing	<b>.017</b>	<b>.245</b>	-.048	.049
Acting with Awareness	<b>.005</b>	<b>.280</b>	-.067	.065
Non-judging	<b>.077</b>	<b>.352</b>	-.151	.029
Non-reactivity	-.176	.129	-.041	.085
Observing	-.051	.219	-.040	.009

Note: **bolded** values indicate significant effects.

### 3.3.2. Supplementary Analyses

Depression, self-esteem, and BMI were included in the main analyses as covariates, as these variables are robust predictors of body satisfaction. However, including these variables as

covariates may have obscured the association between mindfulness and body satisfaction. Thus, the data were re-analysed, excluding depression and self-esteem as covariates. BMI was retained, because of its direct conceptual association with body satisfaction and its extensively empirically demonstrated association with this variable (Ålgars et al., 2009; Neighbors & Sobal, 2007).

**Describing.** *Describing* was a significant predictor of body satisfaction  $B = .195$  ( $SE = .064$ ),  $p = .003$ , 95% CI [.069, .321] and was inversely related to thought suppression,  $B = -.367$  ( $SE = .063$ ),  $p < .001$ , 95% CI [-.491, -.242]. Further, thought suppression mediated the association between describing and body satisfaction,  $B = .062$  ( $SE = .026$ ), 95% CI [.017, .117]. BMI was a significant predictor of body satisfaction ( $p < .001$ ).  $R^2$  for this model was .157, indicating that describing, thought suppression, and BMI accounted for 15.7% of the variance in body satisfaction scores.

**Acting with Awareness.** *Acting with awareness* was a significant predictor of body satisfaction,  $B = .285$  ( $SE = .073$ ),  $p = .049$ , 95% CI [.141, .430]. Additionally, acting with awareness was inversely related with thought suppression,  $B = -.510$  ( $SE = .067$ ),  $p < .001$ , 95% CI [-.642, -.377]. Finally, acting with awareness indirectly related to body satisfaction via thought suppression,  $B = .065$  ( $SE = .035$ ), 95% CI [.000, .140]. BMI was a significant predictor of body satisfaction ( $p < .001$ ).  $R^2$  for this model was .177, indicating that acting with awareness, thought suppression, and BMI accounted for 17.7% of the variance in body satisfaction scores.

**Non-Judging.** *Non-judging* was a significant predictor of body satisfaction,  $B = .310$  ( $SE = .076$ ),  $p < .001$ , 95% CI [.161, .460] and was inversely related to thought suppression,  $B = -.662$ , ( $SE = .048$ ),  $p < .001$ , 95% CI [-.755, -.568]. However, thought suppression did not mediate the relation between describing and body satisfaction,  $B = .016$  ( $SE = .053$ ), 95% CI [-.092, .117]. BMI was a significant predictor of body satisfaction ( $p < .001$ ).  $R^2$  for this model was

.183, indicating that non-judging and BMI accounted for 18.3% of the variance in body satisfaction scores.

**Non-Reactivity.** *Non-reactivity* was not a significant predictor of body satisfaction,  $B = .044$  ( $SE = .087$ ),  $p = .62$ , 95% CI [-.128, .215]. However, non-reactivity was inversely related to thought suppression,  $B = -.483$  ( $SE = .085$ ),  $p < .001$ , 95% CI [-.651, -.316]. Additionally, non-reactivity was indirectly related to body satisfaction via thought suppression,  $B = .110$  ( $SE = .036$ ), 95% CI [.048, .193]. BMI was a significant predictor of body satisfaction ( $p < .001$ ).  $R^2$  for this model was .124, indicating that non-reactivity, thought suppression, and BMI accounted for 12.4% of the variance in body satisfaction scores.

**Observing.** *Observing* was not a significant predictor of body satisfaction,  $B = .133$  ( $SE = .077$ ),  $p = .08$ , 95% CI [-.018, .284] and was not significantly related to thought suppression,  $B = .134$  ( $SE = .085$ ),  $p = .11$ , 95% CI [-.033, .301]. Furthermore, observing was not indirectly related to body satisfaction via thought suppression  $B = -.033$  ( $SE = .023$ ), 95% CI [-.089, .005]. BMI was a significant predictor of body satisfaction ( $p < .001$ ).

Table 4. *Path Estimates and Effect Sizes for the Direct and Indirect Effects of Mindfulness on Body Satisfaction (Supplementary Analyses).*

Facet	Effect of Mindfulness on Thought Suppression B(SE)	Effect of Thought Suppression on Body Satisfaction B(SE)	Effect of Mindfulness of Body Satisfaction B(SE)	$R^2$
Describing	<b>-.367(.063)</b>	<b>-.170(.063)</b>	<b>.195(.064)</b>	.157
Act Aware	<b>-.510(.067)</b>	<b>-.127(.064)</b>	<b>.285(.073)</b>	.177
Non-Judging	<b>-.662(.048)</b>	-.025(.077)	<b>.310(.076)</b>	.183
Non-Reactivity	<b>-.483(.085)</b>	<b>-.227(.063)</b>	.044(.087)	.124
Observing	.134(.085)	<b>-.249(.059)</b>	.133(.077)	.134

Note: **bolded** values indicate significant effects. Act Aware = acting with awareness.

Table 5. *95% Confidence Intervals for the Direct and Indirect Effects of Mindfulness on Body Satisfaction (Supplementary Analyses).*

Facet	Direct Effect		Indirect Effect	
	Lower Limit	Upper Limit	Lower Limit	Upper Limit
Describing	<b>.069</b>	<b>.321</b>	<b>.017</b>	<b>.117</b>
Acting with Awareness	<b>.141</b>	<b>.430</b>	<b>.000</b>	<b>.140</b>
Non-Judging	<b>.161</b>	<b>.460</b>	-.092	.117
Non-Reactivity	-.128	.215	<b>.048</b>	<b>.193</b>
Observing	-.018	.284	-.089	.005

Note: **bolded** values indicate significant effects.

### 3.4. Study 2

#### 3.4.1. Post-Manipulation Between Group Affect Equivalence

After the induction, participants in both the mindfulness and relaxation groups reported similar levels of positive affect,  $t(67) = -.260, p = .80$ . Thus, the inductions were considered to have equivalent effects on mood, thereby allowing the conclusion that group differences on body satisfaction would be due to group differences in mindfulness, rather than affect.

#### 3.3.2. Pilot Test

Although 20 participants were recruited for the pilot test, there were technical difficulties with two participants, preventing playback of the audio recording of the induction. Thus, the data from these two participants were excluded and the final pilot test sample consisted of 18 participants. Given the limited sample size of the pilot test, significance testing was not used to determine effectiveness of the manipulation and inductions. Rather, scores on measures of state body satisfaction and state mindfulness were compared between groups. It was expected that the mindfulness induction groups would have higher scores than the relaxation induction groups on state mindfulness. It also was expected that the weather-focussed groups would have the higher scores than the body-focussed groups on state body satisfaction. If the intended groups had a higher average score, the pilot test would be deemed successful.



Results from the pilot test indicated that students who completed the mindfulness-based induction did not report higher state mindfulness than those who completed the relaxation-based induction. However, in both induction groups, participants who completed a body-focussed writing task experienced less body satisfaction than those in the weather-focussed writing task. No participants reported issues or concerns with either the writing tasks or the inductions. Additionally, no participants reported difficulty understanding the questions assessing state thought suppression. As there were not enough participants to conduct meaningful ANOVAs, there was no way to determine if the effects of the writing task and inductions were statistically significant. Thus, Study 2 analyses were conducted.

Table 6. *Group Means for State Mindfulness and State Body Satisfaction.*

Group	N	State Mindfulness	State Body Satisfaction
Weather focus/Mindfulness	4	<i>2.73</i>	<i>5.44</i>
Body focus/Mindfulness	5	<i>3.13</i>	4.46
Weather focus/Relaxation	6	3.27	<i>6.29</i>
Body focus/Relaxation	4	3.44	4.75

Note: *italicized* values indicate which groups were expected to have the higher average.

### 3.4.3. Main Analyses

Prior to hypothesis testing, past meditation experience was compared across groups, using the questions and coding procedure outlined above (see Demographics Questionnaire, under Methods). An ANOVA revealed no significant differences in meditation experience across groups ( $p = .15$ ).

The third, fourth, and fifth hypotheses were tested using two-way ANOVAs. The third hypothesis was that a brief mindfulness induction, compared to a relaxation induction, would result in higher state mindfulness. An ANOVA revealed no effect of induction on state mindfulness ( $p = .75$ ). The effect size (partial eta squared) was negligible (see Table 6).

The fourth hypothesis was that writing about a disliked body part, compared to writing about unpleasant weather, would result in lower state body satisfaction. An ANOVA revealed no significant effect of writing task on body satisfaction ( $p = .48$ ). Once more, the effect size was negligible.

The fifth hypothesis was that there would be an interaction between writing task and induction, such that there would be no differences in the participants' body satisfaction in the unpleasant weather condition whether they receive the mindfulness or relaxation induction. However, in the disliked body part condition, those who receive the mindfulness induction would report significantly higher body satisfaction than those who receive the relaxation induction. An ANOVA revealed no effect of induction on body satisfaction ( $p = .91$ ), and no interaction between writing task and induction ( $p = .86$ ). Effect sizes were negligible.

Table 7. *2x2 ANOVAs for the Effects of a Writing Task and Induction on State Body Satisfaction, and the Effect of Induction on State Mindfulness.*

	F	df	sig	Partial eta squared
<u>State Body Satisfaction</u>				
Effect of Writing Task	.51	(1, 65)	.479	.008
Effect of Induction	.013	(1, 65)	.911	.000
Interaction (writing task x induction)	.031	(1, 65)	.861	.000
<u>State Mindfulness</u>				
Effect of induction	.103	(1, 65)	.749	.002

## 4. DISCUSSION

### 4.1. Summary of Findings

The aim of the present research was to explore the relation between the various facets of mindfulness and body satisfaction, and to determine whether thought suppression serves as a mechanism of this relation. Additionally, this work sought to determine if a brief mindfulness induction would result in higher body satisfaction compared to a relaxation induction after writing about a disliked body part. Findings from Study 1 support those of previous studies showing an association between mindfulness and body satisfaction. However, with all three covariates depression, self-esteem, and BMI, thought suppression did not mediate this relation. Findings from Study 2 did not support the superiority of a brief mindfulness induction over a relaxation induction. The findings will be further discussed as they pertain to the hypotheses.

### 4.2. General Discussion

#### 4.2.1. Hypothesis 1a

It was hypothesised that higher levels of *describing*, *acting with awareness*, *non-reactivity*, and *non-judgment* would be associated with higher levels of body satisfaction, and that these relations would be mediated by lower trait thought suppression. With the original analytical plan, this hypothesis was partially supported. Higher levels of *describing*, *acting with awareness*, and *non-judgment* were associated with higher body satisfaction. However, these relations were not mediated by thought suppression. Additionally, there was no significant relation between *non-reactivity* and body satisfaction.

These findings are consistent with past research, wherein higher levels of *describing*, *acting with awareness*, and *non-judging* were associated with higher body satisfaction (Dekeyser et al. 2008; Prowse et al. 2013). Although no published research has investigated the association

between *non-reactivity* and body satisfaction, the present finding of no association between these two variables was unexpected, given that *non-reactivity* tends to be positively associated with indicators of psychological well-being (Baer et al., 2006, 2008). It may be that the emotional nonattachment inherent to *non-reactivity* is not sufficient to influence body satisfaction, but it is unclear why this is the case.

Although thought suppression did not mediate the relation between mindfulness and body satisfaction, there were relations between the facets of mindfulness and thought suppression. More specifically, higher *describing*, *acting with awareness*, *non-judgment*, and *non-reactivity* all were associated with lower thought suppression. This is consistent with past research, which demonstrates negative correlations between these facets and thought suppression (Baer et al., 2006).

**Supplementary analyses.** To investigate the relation between mindfulness and body satisfaction, without having the effects potentially obscured by depression and self-esteem, the analyses were conducted anew, using only BMI as a covariate. Once more, *describing*, *acting with awareness*, and *non-judgment* were positively related to body satisfaction.

Additionally, thought suppression mediated the associations between *describing*, *acting with awareness*, and *non-reactivity*, and body satisfaction. Specifically, increased levels of these facets were associated with lower thought suppression, which in turn predicted higher body satisfaction. These results may be explained by the metacognitive activity involved in these facets. All three involve attending to one's thoughts and feelings as well as reflecting on one's reactions to these experiences (Baer et al., 2006). This active reflection on inner experience and reactions to these experiences involves a detached focus on unwanted thoughts and their effect, rather than their avoidance or active suppression. The resulting lower thought suppression would

lead to habituation to distressing appearance related thoughts and therefore, reduced thought frequency over time, which may result in higher appearance satisfaction.

Although *non-reactivity* was not directly associated with body satisfaction, this facet was indirectly associated with body satisfaction via thought suppression. A close examination of the FFMQ items composing this subscale reveals that the *non-reactivity* facet is closely focussed on negative emotional experiences. Thus, maintaining a non-reactive stance toward negative emotions may be associated with body satisfaction only when it is accompanied with tolerance for one's negative thoughts. That is, the "nonattachment to emotional experiences" (Sala & Levinson, 2017, p. 899) inherent in *non-reactivity*, may have to be combined with a detached attention to accompanying thoughts to form an association with body satisfaction.

Finally, the facet *non-judging* was associated with higher body satisfaction, but this relation was not mediated by thought suppression. This was unexpected, given that not judging negative appearance thoughts as "bad" should result in less thought suppression, and therefore, higher body satisfaction. However, the tendency to be non-judgmental towards inner experiences may extend to the *object* of thoughts, including one's appearance. In fact, this proposition is supported by Masuda et al. (2012), who found that higher *non-judging* was associated with fewer disordered eating cognitions, such as "if my weight goes up, my self-esteem goes down." Thus, *non-judging* may have a direct association to the object of thoughts, in this case the appearance of the body, thereby resulting in higher body satisfaction.

#### **4.2.2. Hypothesis 1b**

It was hypothesised that higher levels of *observing* would be associated with lower levels of body satisfaction, and that this relation would be mediated by higher levels of thought

suppression. This hypothesis was not supported, as *observing* was not directly or indirectly related to body satisfaction.

These results are consistent with those of Dekeyser et al. (2008), who found no significant relation between *observing* and body satisfaction. However, the results are inconsistent with those of Prowse et al. (2013), who found an inverse relation between *observing* and body satisfaction.

Further, unlike the other facets, *observing* did not have a significant association with thought suppression. This is consistent with the findings of Garland and Roberts-Lewis (2013), who did not find a significant relation between observing and thought suppression. However, it is at variance with findings from Baer et al. (2006), who demonstrated a positive relation between the two variables.

The mixed results in the literature for *observing* may be due to how this facet functions in naïve versus experienced meditators. Baer et al. (2008) found that higher *observing* is associated with better psychological well-being in experienced meditators, whereas in inexperienced meditators, higher *observing* demonstrates either no relation, or an inverse relation, with indicators of psychological well-being (Baer et al., 2006). Baer et al. (2008) suggest that this is because inexperienced meditators have difficulty applying all facets of mindfulness, and when observing one's negative experiences without maintaining a non-judgmental and non-reactive stance, negative thoughts and feelings may become more salient and less regulated, thereby increasing distress. In fact, the factor structure of the FFMQ in inexperienced meditators contains only four facets, suggesting that the observing may not be sufficiently developed in inexperienced meditators to be measured by the FFMQ (Williams, Dalgleish, Karl, & Kuyken,

2014). In the literature, this is reflected as either positive relations between *observing* and psychological distress, or no significant relations.

#### **4.2.3. Hypothesis 2a**

It was hypothesised that the mediation model involving *non-judging* would explain more variance in body satisfaction compared to the three models involving the facets *observing*, *describing*, and *acting with awareness*. This hypothesis was not supported, as the mediation models accounted for similar amounts of variance (32% - 35%). This may be because all facets involve a habituation effect towards negative body image thoughts. That is, if the various facets work through a similar mechanism, the proportion of variance explained by each model would not differ.

#### **4.2.4. Hypothesis 2b**

It was hypothesised that the mediation model involving *non-reactivity* would explain more variance in body satisfaction compared to the three models involving the facets *observing*, *describing*, and *acting with awareness*. This hypothesis was not supported, as the mediation models accounted for similar amounts of variance (32% - 35%). As mentioned above, this may be due to the habituation effect involved in each facet.

#### **4.2.5. Hypothesis 3**

The third hypothesis was that brief mindfulness induction would result in higher state mindfulness, compared to a relaxation control induction. This hypothesis was not supported, as there were no group differences in state mindfulness.

This was unexpected, given that past research demonstrated that this mindfulness induction results in higher state mindfulness than the relaxation induction (Vinci et al., 2014). The mindfulness induction may not have been effective in the present study for several reasons.

First, therapist-administered interventions for body image are more effective than self-directed interventions (Jarry & Ip, 2005). In the present study, neither induction involved therapist contact. This may have had two effects, first it may have reduced the efficacy of both inductions. Second, it may have dampened each induction enough to prevent the emergence of *differential* efficacy between them. Another possibility is that participants simply did not complete the inductions, or did not give them their full attention. Participants completed Study 2 individually in separate rooms where they could not be observed and therefore were at leisure to not fully engage in the induction.

#### **4.2.6. Hypothesis 4**

The fourth hypothesis was that writing about a disliked body part, compared to writing about unpleasant weather, would result in lower state body satisfaction. This hypothesis was not supported, as there were no group differences in state body satisfaction.

This was unexpected, as Jansen et al. (2016) demonstrated that briefly focussing on a disliked body part decreases body satisfaction. However, participants in their study focussed visually on disliked body parts; that is, they looked at themselves in a mirror (Jansen et al., 2016). Conversely, participants in the present study focussed on a disliked body part by writing about it. Thus, perhaps writing about a disliked body part is not a strong enough manipulation to reduce body satisfaction.

Another possibility is that participants who were in the body-focussed group responded defensively on the measure of body satisfaction. Previous research has demonstrated that individuals who experience a self-esteem threat may respond defensively, by reporting higher levels of body satisfaction than those who do not receive a similar threat (Boersma & Jarry, 2013; Jarry & Kossert, 2007; O'Driscoll & Jarry, 2015). Thus, participants who wrote about a



disliked body part may have reported higher levels of body satisfaction than they were experiencing, as a coping mechanism to deal with the body image threat.

#### **4.2.7. Hypothesis 5**

The fifth hypothesis was that there would be an interaction between writing task and induction, such that there would be no differences in the participants' body satisfaction in the unpleasant weather condition whether they received the mindfulness or relaxation induction. However, in the disliked body part condition, those who received the mindfulness induction were expected to report significantly higher body satisfaction than those who received the relaxation induction. This hypothesis was not supported, as there were no group differences in body satisfaction. As mentioned above, this may be for several reasons: the body-focused writing task may not have been sufficient to reduce body satisfaction, or participants may have responded defensively. Additionally, the inductions may not have been effective because participants may not have fully engaged with them.

### **4.3. Strengths and Limitations of the Present Research**

#### **4.3.1. Research Strengths**

Overall, the present research had several strengths. In Study 1, the inclusion of depression, self-esteem, and BMI as covariates demonstrated that mindfulness predicts variance in body satisfaction, above and beyond the effect of these variables. In the supplemental analyses, the inclusion of BMI as a covariate demonstrated that thought suppression mediates the relation between *describing*, *acting with awareness*, and *non-reactivity*, and body satisfaction, above and beyond the effect of BMI. In Study 2, the inclusion of a weather-focused control group allowed evaluation of the effects of the body-focused writing task. This led to the conclusion that this task may not be suitable for reducing body satisfaction in future studies.

### 4.3.2. Research Limitations

The present findings must be interpreted considering several limitations. First, is the cross-sectional nature of Study 1. Although mindfulness “predicts” body satisfaction, causal conclusions cannot be drawn from this.

Second, although 61% of participants were Caucasian, which is more diverse than other samples (e.g., 86% of participants in Prowse et al. (2013) were Anglo-Saxon), there was not enough diversity to conduct sub-analyses by ethnic or cultural background. This limitation is prevalent in mindfulness and body image research. Given that individuals of different ethnic backgrounds report varying levels of body satisfaction (Rakhkovskaya & Warren, 2016), the relations between mindfulness and body satisfaction may vary by ethnicity.

A third limitation was the method of delivery for the induction. Participants completed Study 2 in a private room. Thus, they could have been distracted from the induction, perhaps by checking notifications on their cell phones or simply by not engaging with the instructions. Even though participants were asked not to use their phones while completing the study, there is no way to be sure of their compliance. Additionally, previous research demonstrates that therapist-administered interventions are more effective than self-directed interventions (Jarry & Ip, 2005). Thus, the use of standardized audio recordings to guide self-directed mindfulness induction and relaxation induction, while intended as a strength, may have reduced their effectiveness.

Finally, there were fewer participants in Study 2 than anticipated. As mentioned above, attrition rates in this laboratory are high for online to in-lab studies. Although participants were reminded of their timeslots for Study 2, many cancelled their time-slots or simply did not attend. Thus, fewer participants than expected took part in Study 2. This may have reduced the statistical power of the analyses, preventing the detection of significant effects.

#### 4.4. Implications and Future Directions

Results suggest that higher mindfulness is associated with higher body satisfaction. The supplemental analyses indicate that thought suppression is one mechanism of this association. This supports previous findings showing that mindfulness-based practices increased body satisfaction in young women. However, these effects generally are short-term, partially due to a lack of continued practice (e.g., Atkinson & Wade, 2014). The present results support the importance of including a thought suppression component in mindfulness interventions, as explaining the effects of thought suppression, and emphasizing the importance of not suppressing one's thoughts is important for developing mindfulness. Furthermore, explaining the mechanisms of thought suppression may provide a further rationale for continued practice, which may promote sustained benefits.

The finding that *observing* is not related to body satisfaction or thought suppression is consistent with some past research (e.g., Dekeyser et al., 2008; Garland & Roberts-Lewis, 2013). However, other research has demonstrated an inverse relation between *observing* and body satisfaction (Prowse et al., 2013) and a positive relation between *observing* and thought suppression (Baer et al., 2006). Baer et al. (2008) suggest that observing negative internal experiences without the deliberate application of the other facets of mindfulness, such as *non-judgement* and *non-reactivity*, may make negative thoughts and feelings more salient, thus increasing distress and attempts at suppression. Combined, this suggests that further research is needed to determine the stability of the relation between *observing* and other psychological variables in non-meditating samples.

There have been no published studies investigating the relation between *non-reactivity* and body satisfaction. This is the first study to demonstrate an indirect relation between *non-*

*reactivity* and body satisfaction. Thus, as with *observing* and body satisfaction, further research is needed to assess the stability of this finding.

Finally, the present results demonstrated that writing about a disliked body part may not be enough to reduce body satisfaction. It is possible that visual focus on one's body is needed to induce changes in body satisfaction. Or perhaps five minutes of writing about a disliked body part was not a long manipulation to reduce body satisfaction. In the future, researchers aiming to reduce body satisfaction in a short period of time should utilise more effective methods, such as mirror exposure (Jansen et al., 2016).

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## APPENDIX A

**Demographic Questionnaire**

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

**Ethnic Background:**

- |                                      |  |
|--------------------------------------|--|
| <input type="checkbox"/> Aboriginal  | <input type="checkbox"/> South or Central America      |
| <input type="checkbox"/> African     | <input type="checkbox"/> Arab or West Asian            |
| <input type="checkbox"/> East Asian  | <input type="checkbox"/> Caribbean                     |
| <input type="checkbox"/> South Asian | <input type="checkbox"/> Other (please specify): _____ |
| <input type="checkbox"/> European    |  |

**School Enrolment**

- |                                    |                                    |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> Part-Time | <input type="checkbox"/> Full-Time |
|------------------------------------|------------------------------------|

**Years in University:**

(Select current year)

- |                                      |  |
|--------------------------------------|--|
| <input type="checkbox"/> First year  | <input type="checkbox"/> Fourth year       |
| <input type="checkbox"/> Second year | <input type="checkbox"/> More than 4 years |
| <input type="checkbox"/> Third year  |  |

**Including your current courses, how many psychology courses have you taken?** \_\_\_\_\_  
\_\_\_\_\_

**What is/are your university major(s)?** \_\_\_\_\_

**What is/are your university minor(s)?** \_\_\_\_\_

**Current occupation**

- |                                    |  |  |
|------------------------------------|--|--|
| <input type="checkbox"/> Part-time | AND                                    | <input type="checkbox"/> Self-employed                 |
| <input type="checkbox"/> Full-time | <input type="checkbox"/> Clerical      | <input type="checkbox"/> Unemployed                    |
|                                    | <input type="checkbox"/> Professional  | <input type="checkbox"/> Other (please specify): _____ |
|                                    | <input type="checkbox"/> Owner/manager | _____  |
|                                    | <input type="checkbox"/> Labourer      |  |

**Have you ever been diagnosed with an eating disorder?**

- Yes  
 No

**Have you ever practiced meditation before?**

- Yes  
 No

**If so, how many times?**

**Have you ever engaged in meditative-type practices before, such as yoga?**

- Yes
- No

**If so, how many times?**

**Have you ever engaged in contemplative-type practices before, such as prayer, rosary or misbaha?**

- Yes
- No

**If so, how often?**

**Have you ever received psychotherapy before?**

**If so, what type?**

**Have you ever received dialectical behaviour therapy (DBT) before?**

## APPENDIX B

**Five Facet Mindfulness Questionnaire (FFMQ)**

Please rate each of the following statements with the number that best describes *your own opinion* of what is *generally true for you*.

Remember, your responses are confidential, so please be completely honest and answer all items.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Never or Very Rarely True</b>	<b>Not Often True</b>	<b>Sometimes True, Sometimes Not</b>	<b>Often True</b>	<b>Very Often or Always True</b>

1. When I'm walking, I deliberately notice the sensations of my body moving.

\_\_\_\_\_

2. I'm good at finding the words to describe my feelings.

\_\_\_\_\_

3. I criticize myself for having irrational or inappropriate emotions.

\_\_\_\_\_

4. I perceive my feelings and emotions without having to react to them.

\_\_\_\_\_

5. When I do things, my mind wanders off and I'm easily distracted.

\_\_\_\_\_

6. When I take a shower or bath, I stay alert to the sensations of water on my body.

\_\_\_\_\_

7. I can easily put my beliefs, opinions, and expectations into words

\_\_\_\_\_

8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

\_\_\_\_\_

9. I watch my feelings without getting lost in them.

\_\_\_\_\_

10. I tell myself that I shouldn't be feeling the way I'm feeling.

\_\_\_\_\_

11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

\_\_\_\_\_

- 
12. It's hard for me to find the words to describe what I'm thinking.
- 
13. I am easily distracted.
- 
14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
- 
15. I pay attention to physical experiences, such as the wind in my hair or sun on my face
- 
16. I have trouble thinking of the right words to express how I feel about things.
- 
17. I make judgments about whether my thoughts are good or bad.
- 
18. I find it difficult to stay focused on what's happening in the present moment.
- 
19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
- 
20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- 
21. In difficult situations, I can pause without immediately reacting.
- 
22. When I feel something in my body, it's hard for me to find the right words to describe it.
- 
23. It seems I am "running on automatic" without much awareness of what I'm doing.
- 
24. When I have distressing thoughts or images, I feel calm soon after.
- 
25. I tell myself I shouldn't be thinking the way I'm thinking.
- 
26. I notice the smells and aromas of things.
-

27. Please answer “Often True” to this item.

28. Even when I’m feeling terribly upset, I can find a way to put it into words.

29. I rush through activities without being really attentive to them.

30. When I have distressing thoughts or images I am able just to notice them  
without reacting

31. I think some of my emotions are bad or inappropriate and I shouldn’t feel  
them.

32. I notice visual elements in art or nature, such as colors, shapes, textures, or  
patterns of light and shadow.

33. My natural tendency is to put my experiences into words.

34. When I have distressing thoughts or images, I just notice them and let  
them go.

35. I do jobs or tasks automatically without being aware of what I’m doing.

36. When I have distressing thoughts or images, I judge myself as good or  
bad, depending what the thought/image is about.

37. I pay attention to how my emotions affect my thoughts and behaviour.

38. I can usually describe how I feel at the moment in considerable detail.

39. I find myself doing things without paying attention.

40. I disapprove of myself when I have illogical ideas.



## APPENDIX C

**White Bear Suppression Inventory (WBSI)**

Read each statement carefully and decide how much it pertains to you personally using the scale below. There are no right or wrong answers. Just give the answer that is most accurate for you.

Remember, your responses are confidential, so please be completely honest and answer all items.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Definitely Disagree</b>	<b>Mostly Disagree</b>	<b>Neither Agree Nor</b>	<b>Mostly Agree</b>	<b>Definitely Agree</b>

- |       |  |
|-------|--|
| _____ | 1. There are things I prefer not to think about.                           |
| _____ | 2. Sometimes I wonder why I have the thoughts I do.                        |
| _____ | 3. I have thoughts that I cannot stop.                                     |
| _____ | 4. There are images that come to mind that I cannot erase.                 |
| _____ | 5. My thoughts frequently return to one idea.                              |
| _____ | 6. I wish I could stop thinking of certain things.                         |
| _____ | 7. Sometimes my mind races so fast I wish I could stop it.                 |
| _____ | 8. I always try to put problems out of mind.                               |
| _____ | 9. Please answer “Strongly Agree” to this item.                            |
| _____ | 10. There are thoughts that keep jumping into my head.                     |
| _____ | 11. Sometimes I stay busy just to keep thoughts from intruding on my mind. |
| _____ | 12. There are things that I try not to think about.                        |
| _____ | 13. Sometimes I really wish I could stop thinking.                         |
| _____ | 14. I often do things to distract myself from my thoughts.                 |
| _____ | 15. I often have thoughts that I try to avoid.                             |
| _____ | 16. There are many thoughts I have that I don’t tell anyone.               |

## APPENDIX D

**Multidimensional Body-Self Relations Questionnaire - Selected Items**

Below is a list of body parts. Please write how satisfied you are with each body part, using the rating scale below.

There are no right or wrong answers. Just give the answer that is the most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Very Satisfied</b>	<b>Somewhat Satisfied</b>	<b>Neither Satisfied Nor</b>	<b>Somewhat Dissatisfied</b>	<b>Very Dissatisfied</b>

**Body Appearance Satisfaction Scale (BASS)**

- 
- |  |  |
|--|--|
|  | 1.Face (facial features, complexion)               |
|  | 2. Hair (colour, thickness, texture)               |
|  | 3. Lower torso (buttocks, hips, thighs, legs)      |
|  | 4. Mid torso (waist, stomach)                      |
|  | 5. Upper torso (chest or breasts, shoulders, arms) |
|  | 6. Muscle tone                                     |
|  | 7. Weight  |
|  | 8. Height  |
|  | 9. Overall appearance                              |

## APPENDIX E

**Multidimensional Body-Self Relations Questionnaire - Selected Items**

Below are a series of statements about how people might think, feel, or behave. You are asked to indicate the extent to which each statement pertains to you personally.

There are no right or wrong answers. Just give the answer that is most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Definitely Disagree</b>	<b>Mostly Disagree</b>	<b>Neither Disagree nor Agree</b>	<b>Mostly Agree</b>	<b>Definitely Agree</b>

**Appearance Evaluation Scale**

- 
- |       |   |
|-------|---|
| <hr/> | 1. My body is sexually appealing.               |
| <hr/> | 2. I like my looks just the way they are.       |
| <hr/> | 3. Most people would consider me good-looking.  |
| <hr/> | 4. I like the way I look without my clothes on. |
| <hr/> | 5. I like the way my clothes fit me.            |
| <hr/> | 6. I dislike my physique.                       |
| <hr/> | 7. I am physically unattractive.                |

## APPENDIX F

**Body Image States Scale (BISS)**

For each of the items below, check the box beside the one statement that best describes how you feel **RIGHT NOW AT THIS VERY MOMENT**. Read the items carefully to be sure the statement you choose accurately and honestly describes how you feel right now.

There are no right or wrong answers. Just give the answer that is the most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items.

*1. Right now I feel...*

- Extremely dissatisfied with my physical appearance
- Mostly dissatisfied with my physical appearance
- Moderately dissatisfied with my physical appearance
- Slightly dissatisfied with my physical appearance
- Neither dissatisfied nor satisfied with my physical appearance
- Slightly satisfied with my physical appearance
- Moderately satisfied with my physical appearance
- Mostly satisfied with my physical appearance
- Extremely satisfied with my physical appearance

*2. Right now I feel...*

- Extremely dissatisfied with my body size and shape
- Mostly dissatisfied with my body size and shape
- Moderately dissatisfied with my body size and shape
- Slightly dissatisfied with my body size and shape
- Neither dissatisfied nor satisfied with my body size and shape

- Slightly satisfied with my body size and shape
- Moderately satisfied with my body size and shape
- Mostly satisfied with my body size and shape
- Extremely satisfied with my body size and shape

3. *Right now I feel...*

- Extremely dissatisfied with my weight
- Mostly dissatisfied with my weight
- Moderately dissatisfied with my weight
- Slightly dissatisfied with my weight
- Neither dissatisfied nor satisfied with weight
- Slightly satisfied with my weight
- Moderately satisfied with my weight
- Mostly satisfied with my weight
- Extremely satisfied with my weight

4. *Right now I feel...*

- Extremely physically attractive
- Very physically attractive
- Moderately physically attractive
- Slightly physically attractive
- Neither attractive nor unattractive

- Slightly physically unattractive
- Moderately physically unattractive
- Very physically unattractive
- Extremely physically unattractive

5. *Right now I feel...*

- A great deal worse about my looks than I usually feel
- Much worse about my looks than I usually feel
- Somewhat worse about my looks than I usually feel
- Just slightly worse about my looks than I usually feel
- About the same about my looks as usual
- Justly slightly better about my looks than I usually feel
- Somewhat better about my looks than I usually feel
- Much better about my looks than I usually feel
- A great deal better about my looks than I usually feel

6. *Right now I feel that I look...*

- A great deal better than the average person looks
- Much better than the average person looks
- Somewhat better than the average person looks
- Just slightly better than the average person looks
- About the same as the average person looks
- Justly slightly worse than the average person looks

☒ Somewhat worse than the average person looks

☒ Much worse than the average person looks

☒ A great deal worse than the average person looks

## APPENDIX G

**Toronto Mindfulness Scale (SMS)**

Please rate each of the following statements with the number that best describes what is true for you right now, at this very moment.

There are no right or wrong answers. Just give the answer that is most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items.

0	1	2	3	4
Not at All	A Little	Moderately	Quite a Bit	Very Much

1. I experienced myself as separate from my changing thoughts and feelings.

\_\_\_\_\_

2. I was more concerned with being open to my experiences than controlling or changing them.

\_\_\_\_\_

3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings, or sensations.

\_\_\_\_\_

4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things “really” are.

\_\_\_\_\_

5. I was curious about each of the thoughts and feelings that I was having.

\_\_\_\_\_

6. I was curious to see what my mind was up to from moment to moment.

\_\_\_\_\_

7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.

\_\_\_\_\_

8. I was more invested in just watching my experiences as they arose, then in figuring out what they could mean.

\_\_\_\_\_



9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.

\_\_\_\_\_

10. I remained curious about the nature of each experience as it arose.

\_\_\_\_\_

11. I was aware of my thoughts and feelings without over-identifying with them.

\_\_\_\_\_

12. I was curious about my reactions to things.

\_\_\_\_\_

13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.

\_\_\_\_\_

## APPENDIX H

**State Thought Suppression (STS)****Body-focus group**

1. How often during the time you were sitting here did you think about the body part you disliked, or about parts of your body you dislike in general?
2. On a scale of 1 to 10, with 1 being *not at all* and 10 being *as hard as you could*, how much did you try to avoid or suppress negative thoughts about your body image?

1	2	3	4	5	6	7	8	9	10
Not at all			Tried a Little			Tried Quite a Bit			As hard as you could

**Weather-focus group**

1. How often during the time you were sitting here did you think about weather that you dislike?
2. On a scale of 1 to 10, with 1 being *not at all* and 10 being *as hard as you could*, how much did you try to avoid or suppress negative thoughts about the weather?

1	2	3	4	5	6	7	8	9	10
Not at all			Tried a Little			Tried Quite a Bit			As hard as you could

## APPENDIX I

**Rosenberg Self-Esteem Scale (RSES)**

Please record the appropriate answer per item, depending on whether you strongly agree, agree, disagree, or strongly disagree with it.

There are no right or wrong answers. Just give the answer that is the most accurate for you. Remember, your responses are confidential, so please be completely honest and answer all items.

4	3	2	1
Strongly Agree	Agree	Disagree	Strongly Disagree

\_\_\_\_\_ 1. I feel that I am a person of worth, at least on an equal plane with others.

\_\_\_\_\_ 2. I feel that I have a number of good qualities.

\_\_\_\_\_ 3. All in all, I am inclined to feel that I am a failure.

\_\_\_\_\_ 4. I am able to do things as well as most people.

\_\_\_\_\_ 5. I feel that I do not have much to be proud of.

\_\_\_\_\_ 6. I take a positive attitude toward myself.

\_\_\_\_\_ 7. On the whole, I am satisfied with myself.

\_\_\_\_\_ 8. I wish I could have more respect for myself.

\_\_\_\_\_ 9. I certainly feel useless at times.

\_\_\_\_\_ 10. At times I think that I am no good at all.

## APPENDIX J

**Beck Depression Inventory (BDI-II)**

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

<p><b>1. Sadness</b></p> <p>0 I do not feel sad. 1 I feel sad much of the time. 2 I am sad all the time. 3 I am so sad or unhappy that I can't stand it.</p> <p><b>2. Pessimism</b></p> <p>0 I am not discouraged about my future. 1 I feel more discouraged about my future than I used to be. 2 I do not expect things to work out for me. 3 I feel my future is hopeless and will only get worse.</p> <p><b>3. Past Failure</b></p> <p>0 I do not feel like a failure. 1 I have failed more than I should have. 2 As I look back, I see a lot of failures. 3 I feel I am a total failure as a person.</p> <p><b>4. Loss of Pleasure</b></p> <p>0 I get as much pleasure as I ever did from the things I enjoy. 1 I don't enjoy things as much as I used to. 2 I get very little pleasure from the things I used to enjoy. 3 I can't get any pleasure from the things I used to enjoy.</p> <p><b>5. Guilty Feelings</b></p> <p>0 I don't feel particularly guilty. 1 I feel guilty over many things I have done or should have done. 2 I feel quite guilty most of the time. 3 I feel guilty all of the time.</p>	<p><b>6. Punishment Feelings</b></p> <p>0 I don't feel I am being punished. 1 I feel I may be punished. 2 I expect to be punished. 3 I feel I am being punished.</p> <p><b>7. Self-Dislike</b></p> <p>0 I feel the same about myself as ever. 1 I have lost confidence in myself. 2 I am disappointed in myself. 3 I dislike myself.</p> <p><b>8. Self-Criticalness</b></p> <p>0 I don't criticize or blame myself more than usual. 1 I am more critical of myself than I used to be. 2 I criticize myself for all my faults. 3 I blame myself for everything bad that happens.</p> <p><b>9. Suicidal Thought or Wishes</b></p> <p>0 I don't have any thoughts of killing myself. 1 I have thoughts of killing myself, but I would not carry them out. 2 I would like to kill myself. 3 I would kill myself if I had the chance.</p> <p><b>10. Crying</b></p> <p>0 I don't cry anymore than I used to. 1 I cry more than I used to. 2 I cry over every little thing. 3 I feel like crying, but I can't.</p>
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<p><b>11. Agitation</b></p> <p>0 I am no more restless or wound up than usual.</p> <p>1 I feel more restless or wound up than usual.</p> <p>2 I am so restless or agitated that it's hard to stay still.</p> <p>3 I am so restless or agitated that I have to keep moving or doing something.</p> <p><b>12. Loss of Interest</b></p> <p>0 I have not lost interest in other people or activities.</p> <p>1 I am less interested in other people or things than before.</p> <p>2 I have lost most of my interest in other people or things.</p> <p>3 It's hard to get interested in anything.</p> <p><b>13. Indecisiveness</b></p> <p>0 I make decisions about as well as ever.</p> <p>1 I find it more difficult to make decisions than usual.</p> <p>2 I have much greater difficulty in making decisions than I used to.</p> <p>3 I have trouble making any decisions.</p> <p><b>14. Worthlessness</b></p> <p>0 I do not feel I am worthless.</p> <p>1 I don't consider myself as worthwhile and useful as I used to.</p> <p>2 I feel more worthless as compares to other people.</p> <p>3 I feel utterly worthless.</p> <p><b>15. Loss of Energy</b></p> <p>0 I have as much energy as ever.</p> <p>1 I have less energy than I used to have.</p> <p>2 I don't have enough energy to do very much.</p> <p>3 I don't have enough energy to do anything.</p> <p><b>16. Changes in Sleeping Pattern</b></p> <p>0 I have not experienced any change in my sleeping pattern.</p> <p>1a I sleep somewhat more than usual.</p> <p><u>1b I sleep somewhat less than usual.</u></p> <p>2a I sleep a lot more than usual.</p> <p><u>2b I sleep a lot less than usual.</u></p> <p>3a I sleep most of the day.</p> <p>3b I wake up 1-2 hours early and can't get back to sleep.</p>	<p><b>17. Irritability</b></p> <p>0 I am no more irritable than usual.</p> <p>1 I am more irritable than usual.</p> <p>2 I am much more irritable than usual.</p> <p>3 I am irritable all the time.</p> <p><b>18. Changes in Appetite</b></p> <p>0 I have not experienced any change in my appetite.</p> <hr/> <p>1a My appetite is somewhat less than usual.</p> <p><u>1b My appetite is somewhat greater than usual.</u></p> <p>2a My appetite is much less than before.</p> <p><u>2b My appetite is much greater than usual.</u></p> <p>3a I have no appetite at all.</p> <p>3b I crave food all the time.</p> <p><b>19. Concentration Difficulty</b></p> <p>0 I can concentrate as well as ever.</p> <p>1 I can't concentrate as well as usual.</p> <p>2 It's hard to keep my mind on anything for very long.</p> <p>3 I find I can't concentrate on anything.</p> <p><b>20. Tiredness or Fatigue</b></p> <p>0 I am no more tired or fatigued than usual.</p> <p>1 I get more tired or fatigued more easily than usual.</p> <p>2 I am too tired or fatigued to do a lot of the things I used to do.</p> <p>3 I am too tired or fatigued to do most of the things I used to do.</p> <p><b>21. Loss of Interest in Sex</b></p> <p>0 I have not noticed any recent change in my interest in sex.</p> <p>1 I am less interested in sex than I used to be.</p> <p>2 I am much less interested in sex now.</p> <p>3 I have lost interest in sex completely.</p>
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APPENDIX K

**BMI**

What is your current height (in inches)?

What is your current weight (in pounds)?

## APPENDIX L

**Toronto Alexithymia Scale-20**

Using the scale provided as a guide, indicate how much you agree or disagree with each of the following statements by circling the corresponding number. Give only one answer for each statement.

1	2	3	4	5	
<b>Strongly Disagree</b>	<b>Moderately Disagree</b>	<b>Neither Disagree nor Agree</b>	<b>Moderately Agree</b>	<b>Strongly Agree</b>	
_____					1. I am often confused about what emotion I am feeling.
_____					2. It is difficult for me to find the right words for my feelings.
_____					3. I have physical sensations that even doctors don't understand.
_____					4. I am able to describe my feelings easily.
_____					5. I prefer to analyze problems rather than just describe them.
_____					6. When I am upset, I don't know if I am sad, frightened, or angry.
_____					7. I am often puzzled by sensations in my body.
_____					8. I prefer to just let things happen rather than to understand why they turned out that way.
_____					9. I have feelings that I can't quite identify.
_____					10. Being in touch with emotions is essential.
_____					11. I find it hard to describe how I feel about people.
_____					12. People tell me to describe my feelings more.
_____					13. I don't know what's going on inside me.
_____					14. I often don't know why I am angry.
_____					15. Please answer "Moderately Disagree" to this item.
_____					16. I prefer talking to people about their daily activities rather than their feelings.
_____					17. I prefer to watch "light" entertainment shows rather than psychological dramas
_____					18. It is difficult for me to reveal my innermost feelings, even to close friends.
_____					19. I can feel close to someone, even in moments of silence.

- \_\_\_\_\_ 20. I find examination of my feelings useful in solving personal problems.
- \_\_\_\_\_ 21. Looking for hidden meanings in movies or plays distracts from their enjoyment.



## APPENDIX M

**Satisfaction with Life Scale**

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item. Please be open and honest in your responding.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Slightly Disagree</b>	<b>Neither Agree nor Disagree</b>	<b>Slightly Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>

- \_\_\_\_\_ In most ways my life is close to ideal.
- \_\_\_\_\_ The conditions of my life are excellent.
- \_\_\_\_\_ I am satisfied with my life.
- \_\_\_\_\_ So far I have gotten the important things I want in life.
- \_\_\_\_\_ If I could live my life over, I would change almost nothing.

## APPENDIX N

**Positive and Negative Affect Schedule**

This scale consists of a number of words that describe different feeling and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>very slightly or not at all</b>	<b>a little</b>	<b>moderately</b>	<b>quite a bit</b>	<b>extremely</b>

- \_\_\_\_\_ interested
- \_\_\_\_\_ distressed
- \_\_\_\_\_ excited
- \_\_\_\_\_ upset
- \_\_\_\_\_ strong
- \_\_\_\_\_ guilty
- \_\_\_\_\_ scared
- \_\_\_\_\_ hostile
- \_\_\_\_\_ enthusiastic
- \_\_\_\_\_ proud
- \_\_\_\_\_ irritable
- \_\_\_\_\_ alert
- \_\_\_\_\_ ashamed
- \_\_\_\_\_ inspired
- \_\_\_\_\_ nervous
- \_\_\_\_\_ determined
- \_\_\_\_\_ attentive
- \_\_\_\_\_ jittery
- \_\_\_\_\_ active
- \_\_\_\_\_ afraid

## APPENDIX O

**Advertisement for Participant Pool – “Personality and How People Think About Themselves”**

You are invited to participate in study about personality and how people think about themselves.

If you agree to participate, you will be asked to complete an online survey which should take approximately 30 minutes. This survey will include a variety of questions about your personality, body image, self-esteem, mood, and basic demographic information such as your age and gender.

In addition to the online survey, you will be asked to select a time slot to come into the laboratory and complete further questionnaires. In order to gain a full understanding of how personality impacts self-perception, both online and laboratory sessions are required. The in-lab portion will take approximately one hour and it will involve questions about self-esteem, mood, personality, and body image. This study also will involve focussed breathing exercises useful in stress-reduction.

The goal of this study is to understand how personality influences how people think about themselves.

## APPENDIX P

**CONSENT TO PARTICIPATE IN RESEARCH****Personality and How People Think About Themselves**

You are asked to participate in a research study conducted by **Jessica Barrington** and **Dr. Josée Jarry** from the **Psychology Graduate Studies Department** at the University of Windsor.

If you have any questions or concerns about the research, please feel to contact Dr. Josée Jarry at [jjarry@uwindsor.ca](mailto:jjarry@uwindsor.ca) or 519 253-3000, ext 2237

**PURPOSE OF THE STUDY**

This study aims to examine the relation between the personality trait, mindfulness, and how people think about themselves.

**PROCEDURES**

If you volunteer to participate in this study, you will be asked to fill out eight online questionnaires, which will take approximately 45 minutes.

**POTENTIAL RISKS AND DISCOMFORTS**

Potential risks are discomfort while answering questions related to body image and topics such as suicidal ideation. Any discomfort should be minimal and temporary. If you become too uncomfortable while participating, you may withdraw at any time and your data will not be used.

**POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY**

Participating in this study may promote self-awareness about personality and how people think about themselves. Additionally, participants will gain familiarity with online research procedures.

Participation also will help the scientific community gain a better understanding of how mindfulness relates to how people feel about themselves.

**COMPENSATION FOR PARTICIPATION**

Participants will not receive a monetary reward for participating in the study, but will receive one and a half bonus points towards their Psychology class.

**CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. Data will be aggregated for analyses and no data will be associated with an individual. The data will be

conducted and stored online, using FluidSurveys, which ensures complete confidentiality. FluidSurveys does not record any information from the device accessing the website, except for the answers provided on the questionnaires. Once the questionnaires are completed, the data will be uploaded to an SPSS spreadsheet and stored on the principal investigator's computer and the lb computer. Only the principal investigator and the faculty supervisor will have password required to access the data file. Upon completion of the study, participant data will be kept for approximately nine years, and then all data will be destroyed. This is in compliance with psychology discipline guidelines of keeping data for seven years post publication.

#### PARTICIPATION AND WITHDRAWAL

You can only participate in this study if you are a female who has never been identified as having an eating disorder. If you choose to withdraw at any point, you may do so. All you have to do is leave the browser window or click "Withdraw," and your data will be discarded. If you choose to withdraw, you will not receive your bonus point. All incomplete data will be destroyed. If you would like to withdraw after completing the study, you may do so by contacting the primary investigator (Jessica Barrington) before December 7<sup>th</sup>, 2016 (barringj@uwindsor.ca).

#### FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

A summary of results is expected to be available on the Research Ethics Board Website after June 2017.

Web address: [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb)

#### SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

#### RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

#### SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I understand the information provided for the study **Personality and How People Think About Themselves** as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

**Note: By clicking on the following button, you are indicating that you are 18 years of age or older, have read the Invitation to Participate, consent to participate and understand that you are free to withdraw from the study at any time.**

I Agree

APPENDIX Q

**Prompts for Body-Focus Writing Task**

Think of a part of your body you do not like. What is it?

What is it about the body part that you dislike (e.g. size, shape, appearance)?

When did you start to dislike that body part?

Do you think that part of other's bodies looks better? Why or why not?

What do you wish that body part looked like?

What are some words you would use to describe that body part?

APPENDIX R

**Prompts for Weather-Focus Writing Task**

Think of a type of weather you do not like. What is it?

What is it about that weather that you dislike (e.g. temperature, humidity, sunlight)?

When did you start to dislike that type of weather?

Do you think the weather is better in other parts of the province? Why or why not?

What types of things does that weather prevent you from doing?

What are some words you would use to describe that weather?

## APPENDIX S

**Mindfulness Script**

“Now you are going to do a brief stress-reduction exercise. While sitting down in your chair, place your feet flat on the floor. Sit up straight. Relax your shoulders, relax your neck, and place your hands in your lap or on your knees. As you settle into a comfortable position, commit yourself to simply being fully awake, fully present for these next few moments. If you feel comfortable with it, gently close your eyes. Otherwise, just look toward the floor.

Focus on tuning into the feeling of the breath moving in and out of your body. Focus on the sensation of the breath moving through your nose on each in breath and each outbreath. Allow yourself to just be here in this moment, following the breath as it comes in and as it goes out. Just breathe and let go. Breathe and let be.

Naturally your mind may wander off into thoughts of one kind or another. Take note of any thoughts as they come up. Note what's on your mind and how your body is feeling. Acknowledge these thoughts, whatever they are, without judging or evaluating them. And then just gently let them go. Bring your attention back to the breath, focusing on the feeling of the breath coming in and out of your nostrils.

And each time you notice that your mind has gone off somewhere else, wherever that may be, just bring your attention back to the feeling of the breath. And if the mind wanders off a thousand times, you simply bring it back a thousand times, intentionally cultivating an attitude of patience and gentleness towards yourself. This means choosing as best you can not to react to or judge any of your thoughts or feelings, impulses or perceptions, reminding yourself instead that absolutely anything that comes into the field of awareness is ok. We simply sit with it and breathe with it and observe it, staying open and awake in the present moment, right here, right now, a continual process of seeing and letting be, seeing and letting go, rejecting nothing, pursuing nothing, dwelling in stillness and in calmness as the breath moves in and out.

If you'd like, commit yourself to bringing this attitude of attention and acceptance with you throughout your day, being fully aware in the present moment, noticing any thoughts or feelings that may arise, without judging them - just being right here and right now, accepting the present moment, and accepting yourself, no matter what happens. Remember that you can always bring your focus back to your breath, back to the sensations of the present moment, to cultivate this sense of attention and acceptance.”



## APPENDIX T

**Control Script**

“Now you are going to do a brief stress-reduction exercise. While sitting down in your chair, place your feet flat on the floor. Sit up straight. Relax your shoulders, relax your neck, and place your hands in your lap or on your knees. If you feel comfortable with it, gently close your eyes. Otherwise, just look toward the floor.

For the next several minutes, I would like you to try and relax your body. Start by taking a few deep breaths to relax. As you do so, your body may physically begin to feel more relaxed. Continue to take a few more deep breaths, and let go of any tension you may feel. Just allow yourself to relax. Draw your attention to the muscles in your right hand and relax them. Release any tension in your hand. You may begin to feel more heavy. Now, relax your left hand. Just let the muscles go. Relax your entire right arm in a similar way. Allow your muscles to feel more and more relaxed. Shift your attention to your left arm and relax it as well. Continue to release any tension in your hands and arms feel.

Relax the muscles in your face and neck. Slowly notice how your body is feeling more and more heavy with relaxation. Continue to allow all the muscles in your face and neck to relax. Your upper body may feel more relaxed now than it did when you first started to relax your muscles.

Draw your attention to your chest and shoulders. Allow your chest and shoulders to relax. Recognize how your body may feel warm and heavy as you continue to relax more deeply. Just let the muscles go. Relax the muscles in on your abdomen and back. Again, just allow all of these muscles to relax. Continue to relax. You may feel less tense and more relaxed.

Attend to the muscles in your upper leg and tell these muscles to relax as well. Notice the relaxation you are experiencing. Continue to relax by relaxing your calves. Your body may be becoming more heavy and relaxed. Let your body relax and release any tension. You may feel more relaxed not than you did initially. Shift your attention to your feet. Again, allow all the muscles around your feet to relax.

While continuing to relax your body, take a few more deep breaths. Your hands, arms, face, and neck may feel more relaxed. Also your chest, shoulders, abdomen and back may be less tense. Finally, the muscles in your legs and feet may also be more relaxed. Take one more deep breath in and out and slowly open your eyes.”

## APPENDIX U

**POST-STUDY INFORMATION LETTER**

Thank you for your participation in our study. The information we gathered will be used to explore the relation between mindfulness and body image.

Mindfulness is a personality trait that involves the direction of attention to experiences and an open, curious, and accepting attitude towards what arises in the present moment (Bishop et al., 2004). Higher levels of mindfulness are related to higher levels of body satisfaction (Dijkstra & Barelds, 2011), but it is not clear how. This study is investigating whether thought suppression may play a role in how mindfulness is related to body image. Thought suppression is the tendency to avoid cognitions that one views as intrusive or unwanted (Wegner & Zanakos, 1994). It is hypothesized that higher levels of mindfulness may result in lower levels of thought suppression, which, in turn, results in having the unwanted thoughts less often. By having fewer negative appearance-related thought, body dissatisfaction itself may decrease.

Mindfulness has been found to reduce body dissatisfaction (Adams et al., 2013; Atkinson & Wade, 2014). However, it is unclear if mindfulness serves as a protective factor against increased body dissatisfaction after a task that generally increases body dissatisfaction. Focussing on disliked body parts has been found to increase body dissatisfaction, depression, anxiety, and stress (Jansen et al., 2016). This study is exploring whether engaging in a mindfulness intervention prevents increases in body dissatisfaction after focussing on a disliked body part.

Body image and mindfulness are both broad areas of research in psychology, and several psychological and behavioural factors are related to both. Some such variables are self-esteem and depression. The questionnaires you filled out includes questions in these areas and will help us better understand how mindfulness may relate to body image.

If you feel any discomfort, we invite you contact Dr Josée Jarry (jjarry@uwindsor.ca or 519 253-3000 ext. 2237) or contact the student counselling centre (<http://www1.uwindsor.ca/psc/> or 519 253-3000 ext. 4551).

If you wish to withdraw your data you must email Jessica Barrington (barringj@uwindsor.ca) *before* December 7<sup>th</sup>.

Final results will be available online at [www.uwindsor.ca/reb](http://www.uwindsor.ca/reb) by June 2017.

## APPENDIX V

**CONSENT TO PARTICIPATE IN RESEARCH****Personality and Self-Perception**

You have just participated in a research study conducted by Jessica Barrington, supervised by Dr. Josée Jarry, from the Department of Psychology at the University of Windsor entitled: Mindfulness as a Protective Factor Against Body Dissatisfaction and its Mechanism of Action.

As a final component of the larger study you have just completed, you are being asked to allow this investigator to obtain a measure of your height and weight, so that your body mass index (BMI) can be calculated. The information you provide will remain confidential and will be disclosed only with your permission. Any information you provide will be used for research purposed only, which may include subsequent research or publication of a research article.

Taking part in this final component of the study is completely voluntary. If you do not wish to be weighed and/or have your height measured, you are free to refuse without any penalty or loss of bonus points.

Again, if you have any questions or concerns about the research, please feel to contact the primary investigator, Jessica Barrington at (902) 210-4730, or the faculty supervisor, Dr. Josée Jarry at (519) 253-3000, extension 2237. If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: [ethics@uwindsor.ca](mailto:ethics@uwindsor.ca)

If you are willing to participate in this component of the study and understand all that will be asked of you in participating, please sign your name following this consent statement: I am willing to allow the investigator to measure my weight and height. I understand that all information I provide will be used for research purposes only and that my confidentiality will be assured. I also realize I am free to withdraw from this study at any time without penalty.

## SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

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 Name of Participant

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 Signature of Participant Date

SIGNATURE OF INVESTIGATOR

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 Signature of Investigator Date

## VITA AUCTORIS

Jessica Barrington was born in 1993 in Cold Lake, Alberta. She moved to Porter's Lake, Nova Scotia in 1996. She graduated from Eastern Shore District High School in 2011. She attended St. Francis Xavier University and graduated with a Joint Honours Bachelor of Science in Psychology and Biology. She is currently a Master's student in the Clinical Psychology-Adult Track program at the University of Windsor.